

# University News

## School of Planning & Architecture Convocation



Dr. S. Z. Qasim, Secretary, Department of Ocean Development, Govt. of India, delivering the convocation address at the School of Planning and Architecture, New Delhi. Seated on his left are Prof. H. P. Bahri, Dean of Studies and Prof. Bruno Dias Souza, Director of the School.

# CLASSIFIED ADVERTISEMENT

## GULBARGA UNIVERSITY GULBARGA

Administrative Office, 'Jnana Ganga'

No. GUG/ADM/EST/(T)/85-86/4216

Dated : 29-3-1986

### ABSTRACT NOTIFICATION

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tage being given to M. Phil. or equivalent Degree or research work of quality) may be appointed, provided he has done research work for at least two years or has practical experience in a research laboratory/organisation on the condition that he will have to obtain a Doctor's Degree or give evidence of research of equivalent high standard within 8 years of his appointment, failing which he will not be able to earn future increments until he fulfils these requirements.

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Editor :  
SUTINDER SINGH

## Education and India in 21st Century

Biman Sen\*

### Introduction

Since Independence, volumes have been written, perhaps more have been spoken, on the reform of education in India and evils of colonial system of education left behind by the British Government.

Planning for future needs not only a critical analysis of the past to understand the mechanics of development and to identify the failures and achievements of a system in relation to its defined objective, but also to analyse the general psyche of the people responsible for development of the system. Keeping these two essential elements in view, it may be worthwhile to review the correct position in respect of educational development in the country in the past.

Lord Macaulay's famous minutes which laid the foundation of a modern educational system in India, were approved in 1835. Much before that, Raja Ram Mohun Roy, who could be called the father of the Indian Renaissance Movement had advocated European system of education in India to reap the benefits of the Great Industrial Revolution which was sweeping the Western World. Ram Mohun Roy was the first man to form an Association for founding an institution where instructions were given to the students in European languages and science, although he was a distinguished scholar of both Persian and Sanskrit. In spite of his scholarship in two classical oriental languages Raja Ram Mohun Roy vigorously protested against the establishment of a Sanskrit College in Calcutta as he wanted Indian youths to march forward and to break the stagnation in Indian society. He did not want his young compatriots to acquire "vain and empty subtleties of speculative men".

The greatest social reformer of modern India, Swami Vivekananda, attributed the downfall of our country to "narrowing our views, the scope of our action, we did not go out to compare things with other nations, did not take note of the changes around us. I am thoroughly convinced that no individual or a nation can live by holding itself from the community of others." (Swamiji died in 1902). Swami Vivekananda, indeed, gave a clarion call to the youths of India when he said "Come out of your narrow holes and have a look around, see how nations are on the march."

One should not forget that Swami Vivekananda was a product of the Macaulian system. He was a combination of a modern man and a social reformer, whose views on modernisation are, even, today, beyond the comprehension of many Indian politicians. Swamiji was proud of our heritage but he was not a victim of false vanity.

It may be worthwhile to quote Swami Vivekananda's views on modernisation :

"What we need is to study different branches of the knowledge, that is our own and with it the English language and Western sciences, we need technical education and all else which may develop industries."

What Swamiji perhaps dreamt of—an India—a rare synthesis of the best of the East and the West—Western science with Buddhist philosophy of humanism.

\*Executive Director, International Educational Consortium and  
Former UNESCO Expert.

India is destined to be a great nation, that is why probably people of India entrusted their destiny in the hand of Pandit Jawaharlal Nehru, who was a rare combination of East and West and shared the same views on modernisation of India as Swami Vivekananda.

1985 may be considered a watershed in the history of Indian development, a sharp departure from the path of stagnation to the path of rapid modernisation and progress as dreamt by Swamiji and Panditji. Since education is the most powerful instrument for socio-economic change, Prime Minister, Rajiv Gandhi has emphasised more than once—the need for revolutionary change in the educational system of our country.

Reform of education can neither be considered in vacuum nor in isolation. It is holistic in character and a sub-system of the total development process. Therefore, for any reform or re-orientation of education, it is necessary to make a critical study of the development of education in India, in historical perspective and its relationship with other human activities which form an integrated and Inter-related system.

### **Education in India—Historical Perspective**

Prior to the Industrial Revolution; education was a very exclusive domain of a few privileged individuals or a group and had served as an instrument of exploitation of the masses. The Industrial Revolution which revolutionised the system of production and distribution, was a major watershed in the human history. For very survival of the ruling elites and their associates, access to education was liberalised to cover larger section of population in the countries affected by the Revolution. However, even today, education remains an instrument of exploitation, of course, with specific objective and purpose. Keeping this aspect in view, we should examine the colonial system of education introduced on the basis of Macaulay's minutes and modified from time to time.

Before, Lord Macaulay's minutes on reform of educational system in India, Lord Mount Stuart Elphinstone expressed his views on the future of education in India, before the Lord's Committee in 1830 and communicated them to the Commissioner for India Affairs which are quoted hereunder :

"I conceive, it is more important to impart a higher degree of education to the upper classes than to diffuse a much lower sort of it among common People. The most important branch of education is that, designed to prepare natives for public employment."

On the basis of the above understanding, schools were established in Bombay and Poona. The Elphin-

stone College in Bombay was a product of the above policy.

The ideas expressed in Lord Macaulay's minutes, which laid the foundation of a modern educational system in India were, not a result of his stay in India, but as a result of his study of the problems before coming to India. Before leaving England, he expressed his views in his statement before the House of Commons (The British Parliament) and I quote;

"Are we to keep people of India ignorant in order that we may keep them submissive ? or do we think that we can give knowledge without awakening ambition ? or do we mean to awaken ambition and to provide it with legitimate vent ? It may be that public mind may expand under our system, until it has overgrown the system, that by good government, we may educate our subjects into a capacity for better government that having become instructed in European knowledge, they may, in some future age demand European institutions. Whether such a day will ever come, I know not. Whenever it comes, it will be the proudest day in English history. The sceptre may pass away from us. Victory may be inconsistent to our arms but there are triumphs which are followed by no reverse." The contemporary history tells us how prophetic was this statement of Macaulay.

We should examine the development of educational system in India during the British Raj in the context of Lord Elphinstone and Lord Macaulay's statements quoted earlier.

The Macaulian system of education was specially designed, primarily to produce trained manpower required for running a colonial system of Government to support an industrial society in the United Kingdom, and not to develop human resources to run efficiently an industrial society in India. Can anyone deny the fact that with all the faults in the educational system, it admirably achieved its objective and purpose as defined by the colonial regime ? In the process, one cannot also deny that the system had laid the foundation of a educational and training system required for promoting an industrial society in India. With all its limitations and constraints, the system was able to produce a galaxy of well known scientists, administrators, politicians, etc. Because of such a foundation, within a short-period, after independence, India could become one of the world's ten industrial countries and third in the world as producer of trained scientific and technical manpower.

After independence, instead of blaming colonial educational system, we should have found out the short-fall in the system and rectified the defects.

However, instead of that, we started tampering with the system, without any objective and purpose. The result has been disastrous. The educational system has generated indiscipline, fissiparous tendencies, intolerance etc., which are, in fact, anti-education.

The colonial educational system had its objective and purpose very clear. The system was essentially designed to train manpower to run governmental machinery efficiently with limited responsibility and to maintain fairly efficiently the infra-structure required to run such a Government for exploiting resources and marketing its product, to sustain a comfortable life of an industrial society in U.K. Therefore, the colonial system of education failed to inculcate in an individual spirit of enquiry and self-reliance, discipline and self-confidence and the new value system which is essential to run an industrial society efficiently and effectively. It was neither meant to develop work ethos nor dignity of labour nor to serve as an instrument of change.

The British interest and objectives were very clear, not to change Indian society with changing trends, in environment but to exploit the resources to the maximum. In the name of non-interference with socio-religious customs, the British Government shrewdly kept Indian society in stagnation. Before going into this aspect of the problem, it may be desirable to analyse the development as a system, and deal with the inter-relation between various sectors of human activities in the whole process of development.

#### Development Process—A system analysis

Development is a complex process with expanding horizon, embracing entire ecosystem. Its matrix forms an integrated system.

The co-relationship between education, economic and social development and human aspirations can be represented by a system diagram as in Diagram-I.

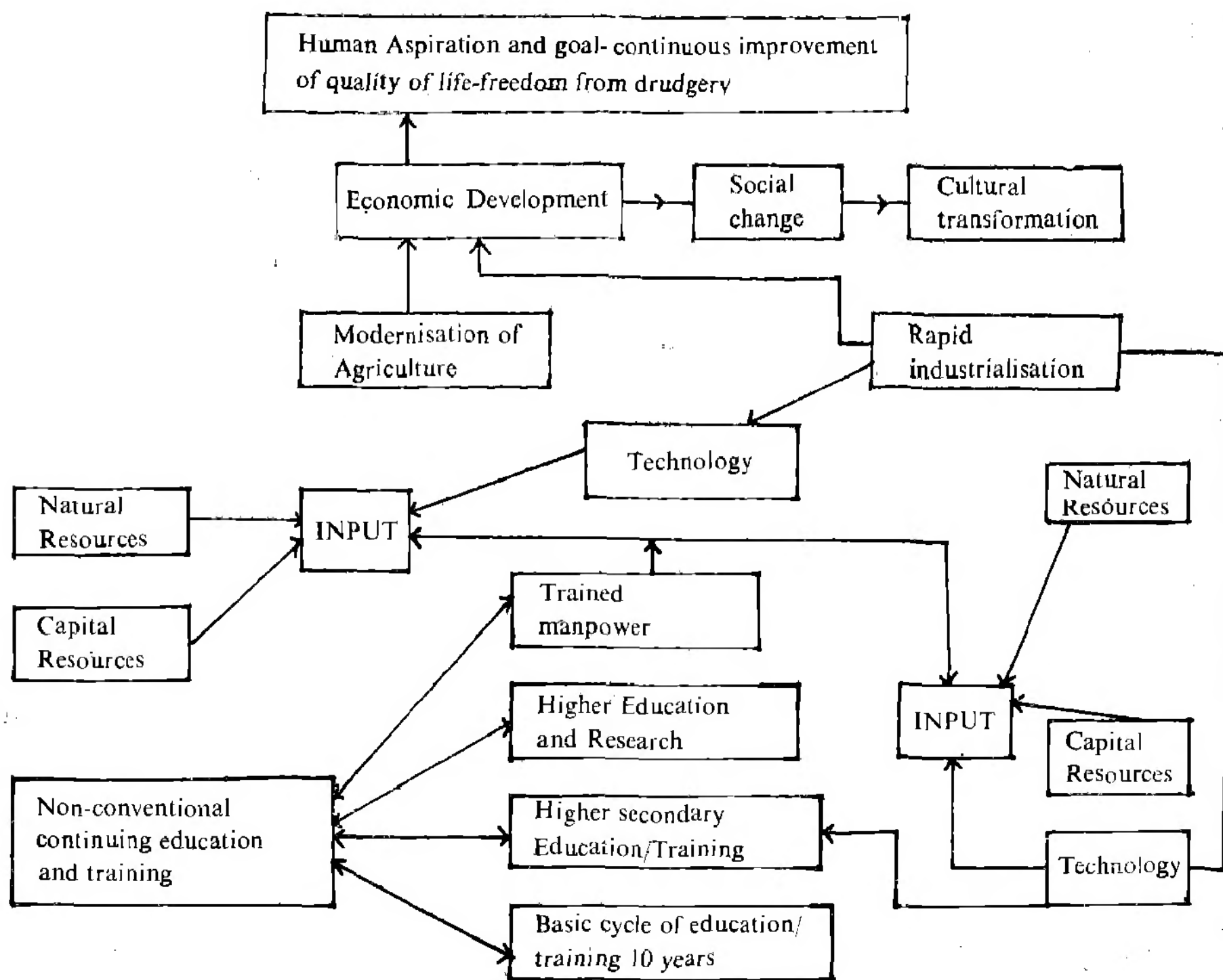


DIAGRAM-I



It may be observed that social changes are by-products of economic development and cultural transformation is an off-shoot of social change. This theory can be easily derived from critical studies of economic history and history of evolution of human society. However, one cannot deny the fact that socio-cultural environment does affect economic development in a large measure. Sometime they offer formidable resistance to change. Most of the developing countries including India and China are the victim of this resistance. Only through an effective education and training, the situation can be reversed.

### **Education—A powerful instrument for change**

Education is the most powerful instrument for effecting changes in the human society, as it is responsible for total development of human personality. If someone studies the systems of education in the world, it would be observed that it is being used very effectively as an instrument of training young minds in developing some sort of chauvinism, either highly biased to nationalism, or political ideology or religious fanaticism and so on. The present education system, irrespective of any country and the rapid advancement of science together with sophistication of technology, have created a dangerous situation in the world. Unless this situation is reversed by deliberate efforts, without any delay, it may be difficult to save the world from total destruction. We are gradually advancing on the path of no return.

At the turn of 19th century, Swami Vivekanand, gave the best interpretation of the status of education, when he said—"Education has yet to be in the world, and civilisation—civilisation has begun nowhere yet." His interpretation holds good even today, when the world is marching toward 21st century. In the first quarter of the 20th century, the world famous intellectual Dr. H.G. Wells, gave providential warning to caution the world, when he said: "Human history becomes more and more, a race between education and catastrophe."

Today, we are perhaps advancing towards catastrophe—unless something is done to revolutionise world educational system to reverse the trend, which is not an easy task unless world public opinion unites to do so. In this context, one may recall Senator J. William Fulbright's remarks that "Education is a slow moving but powerful force. It may not be fast enough or strong to save us from catastrophe but it is the strongest force available."

It is for us to make it fast and strong, if we want to avoid the catastrophe.

If mankind is to be saved from total destruction, role of education has to be changed from only training

and instrument of exploitation to real instrument of change with all its ramifications. Let our New Education Policy (now under formulation) serve as a model to the world, and let, future Indian education provide a basis of the "Unity of Man" and the concept of one world in the 21st century. This will however need, first, to re-define or define the very philosophy and objective of education, its goal in clearer terms.

Before, any attempt is made to define or re-define education and its objectives and goals, it may be desirable to analyse various factors which influence development of an education and training system. From the system diagram I, it may be observed that it is holistic in character and sub-system of the total developmental process. However, the diagram does not give various factors which influence, the development and growth of education in particular and total development process in general.

### **Major Factors Influencing Education**

Man (both the human species male and female) is the centre of all development. One of the roles of education and training is to develop human resources for socio-economic development. It is influenced by various factors; major factors which influence their growth and development—are internal environment—embracing politics, industrial growth, defence needs, social compulsions, national aspirations etc; and international environment, including political, economic, science and technology and many other factors.

For better understanding, various factors are represented by the system diagram II. (Given on next page).

It may be observed from the system diagram II, in ideal conditions, all the factors should influence the growth and development of education and training, but in actual practice, it is only the political factors which are, in fact, controlling their growth. As a result, the world is moving towards catastrophe. If we have to reverse the direction toward peace and stability of the world, the major factors which should control the development of education and training should be advancement of science and sophistication of technology and not politics.

It may be interesting to note that advancement of science and sophistication of technology are the results of the works of a few dedicated and committed people who are continuously searching for truth and to unravel the mysteries of nature. However, as soon as the results of their work are out, they are used by the politicians to exploit the world for their own selfish motive. When Albert Einstein gave his formula  $E=mc^2$ , little did he know that his formula would lead to total destruction of

Hiroshima or Nagasaki. It is a tragedy that education, at present, is unable to counteract this phenomenon.

## Indian Development after Independence

India regained her independence in 1947, not through a bloody revolution of the kind of Russian or Chinese Revolution, or through a war of independence of American type, but through a pre-planned transfer of power. Net result was partition of India.

Consequently, the country had to pass through a traumatic experience. Thousands of lives were sacrificed. This situation built up both internal and external stress and strains, legacy of which lingers even after 38 years of independence, rather the situation over the years has deteriorated—communal riots, caste riots, Punjab, Assam problems etc. are the manifestations.

Consequent upon the transfer of power, in an unusual fashion, not only all the legacies of colonial rule

but also the evils of a feudal tradition and stagnated society silently crept into Indian politics. This has affected adversely all developments in India where pragmatism has become a casualty and the development of the country a victim of populism, emotionalism dogmas etc. These are reflected in our Constitution—which has already gone through 50 odd amendments.

Prior to independence, the British Govt. very cleverly avoided any major reform of the harmful social and religious practices in the name of non-interference except that it abolished, under pressure from the Raja Ranimohun Roy, "Sati Daho" ("widow burning") and later on killing of girl child, practised in some states. However, these socio-religious weaknesses were fully utilised by the British Government to their best advantage by the principle of divide and rule.

Since independence, there has been perpetual struggle in all fields of development, between modernists and traditionalists.

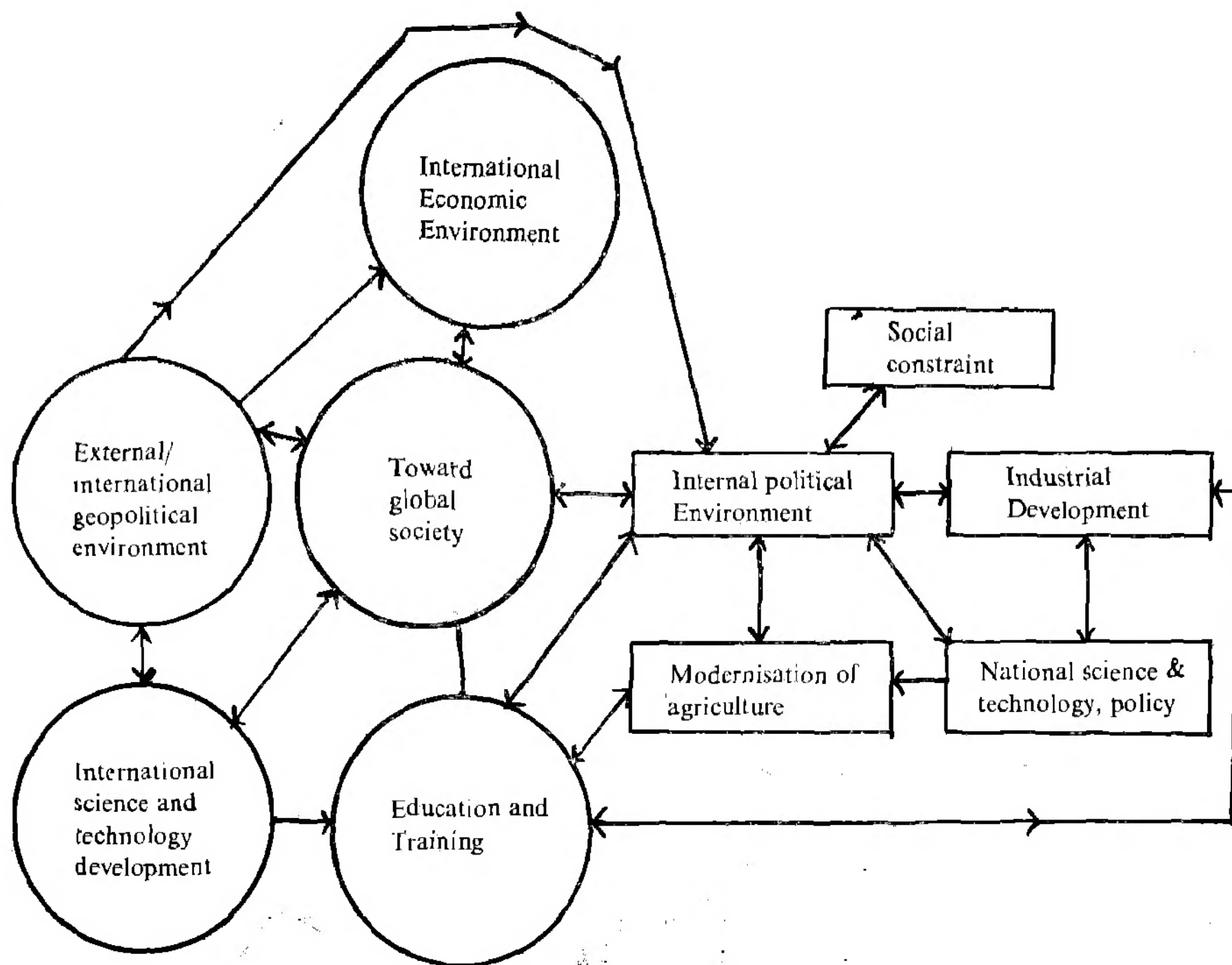


DIAGRAM-II

Modernists led by Pandit Jawaharlal Nehru advocated rapid industrialisation backed by modernisation of agriculture through application of science and technology to build India, a strong and powerful industrial country. But they had to face strong resistance from traditionalists. In spite of all the hurdles from the traditionalist forces, Pandit Jawaharlal Nehru laid a solid foundation of a modern India through his policy of development of science, technology and heavy industry, and other measures.

After Nehru, with a short interlude of late Shri Lal Bahadur Shastri, Mrs. Indira Gandhi, was at the helm of the affairs of the country.

During the first phase of her Prime Ministership, much of Mrs. Gandhi's time, had to be devoted for establishing herself as a leader and consolidated her party and position. In the process, Mrs. Indira Gandhi became a victim of extreme jealousy of her own senior colleagues who had hardly any understanding or concept of planned development. For promotion of Indian development she took many hard decisions such as nationalisation of banks, abolition of privy purses, etc.

During the second phase of her tenure, Mrs. Gandhi became more free to act for modernisation of India. First major action was to give the country a technology policy and direction for growth of technology in the country.

During her tenure as Prime Minister, there had been a tremendous all round growth and development. India became self-sufficient in food, one of the ten industrial nations of the world and third country in the world in the development of technical and scientific manpower. Mrs. Gandhi, in fact, put a massive super-structure on the foundation laid by her father for development of India as a modern industrial country.

However, Mrs. Indira Gandhi, being a product of the pre-independence movement, could not escape the dichotomy in Indian development, tossing between tradition and modernity.

Dichotomy in politics, not only affected our economic and industrial development, but it has also produced a very adverse effect on development of education and training. Except, perhaps technical education, where there was some control from the centre, there has been gradual deterioration in all spheres of education and training. The school education and training is perhaps the worst sufferer since independence. In terms of quantitative statistics, there has been a tremendous development. But in terms of quality, the general standard of education has fallen and it has helped to develop spirit of disintegration, fissiparous tendencies, indiscipline, indifferent attitude etc. The education has been highly politicised today. The

government language policy has largely contributed to the present situation. Of course, our Constitution is also largely responsible for such a situation. Realising the damage already done to our education, to reverse the position, Mrs. Indira Gandhi amended the Constitution to bring education on the concurrent list. But before she could move any further, she fell to the assassin's bullet.

Rajiv Gandhi is neither a product of Indian freedom movement nor a child of traditional Indian politics. He has an open mind and modern outlook. Moreover, he comes from an exacting and technical profession sensitive to quick action, capacity to coordinate large number of activities with an eye to minute details.

Soon after assuming power, Mr. Rajiv Gandhi realised that nothing could be achieved without peace and stability, and revolutionary reform of education to march into 21st century with confidence. So in his inaugural address to the nation as Prime Minister, he emphasised to give highest priority to educational reform because the present Indian psyche can only be changed through revolutionary change in the educational system. Such a change would need strong "political will", courage of conviction, and total commitment on the part of "political leadership".

Apart from other factors, educational reform to be pragmatic to take the nation to 21st century, which is going to be a sophisticated age of science and technology and creativity, should be correlated to the trends of changes in the techno-economic environment both at the national and international levels.

Education, being forward planning, needs a futuristic approach for a long term perspective of 25 to 30 years of techno-economic development. Techno-economic development has direct impact on social change. It is, therefore, only logical that the educational reform should be tuned, not to the social situation prevailing today but to the social situation which is going to be when its products will be the managers of such a society.

It may not be difficult to simulate alternative models of Indian society in the 21st century, if we critically analyse the trends of change in certain economic factors, specially agricultural and industrial development which are responsible in shaping the future of a society.

### **Techno-Economic Factor**

Man (both male and female) who is in the centre of all development, but being a part of the eco-system, has to live in harmony with nature. Therefore in developing agriculture of any other human activity, conservation of natural resources becomes a matter of paramount importance and limiting factor for formulating any strategy for agricultural development, in particular



which, in turn, dictates the type of social development possible or desirable.

The strategy of agricultural development depends on two major factors : (i) how many mouths to feed; and (ii) how much land can be used for agricultural purposes (excluding forest development) in future to sustain, all round development of India in 21st century.

In 2001 A.D., according to all estimates (conservative), India will have a population of about one billion even if we succeed in reducing birth-rate.

As for availability of land, India has only about 329 million hectares; of which only about 300 million hectares may be useable for the purpose. This is exactly the area, under forest in United States of America. According to available scientific data, only about 15 per cent of land in India is under forest and that too, is slowly declining. Out of the total useable available land, unless gradually by deliberate effort, we convert about 60 to 66 per cent of the total area of land in forest during next 15 to 20 years, the very survival of India may be threatened, because India has 6000 km. of coastal belt, two huge mountain ranges (Himalaya and Vindhya), fourteen major rivers, their ecology to be protected to save the country from soil erosion, droughts and flash floods, not to speak of preserving underground water resources and country's rich flora and fauna. In addition, the country has to meet fuel needs of a huge population—both for domestic use and commercial needs, like production of paper etc. It is not an impossible task. Many countries like Japan, Korea and others have accomplished it.

If we are serious about entering into 21st century with speed and confidence, immediate steps should be taken in implementing afforestation programme on a war footing. Then by 2001 AD we shall be left with hardly about 100 to 120 million hectares of land for agriculture, human habitation, industry and to support other infrastructure required for a modern techno-industrial society comprising of about one billion population. Can we in the circumstances, afford the luxury of so-called rural environment, as some of our planners are pleading for ?

We are proud of our agricultural achievement, that we have achieved self-sufficiency in food-production. Did we ever examine at what cost ? Do our people get nutrition of international standard ? What we have done in practice is created some small pockets of green-revolution and increased our production not through increasing productivity as such but through increasing production by bringing more land under cultivation. In 1950-51, India was using only 118.7 million hectares and today there is about 162 million hectares. India's agricultural productivity is hardly, about 20 to 25 per cent of that of the developed countries. Can we afford to

use that much land for agriculture at the expense of forest and other land use ?

It is reported foodgrain output of China touched 387 million tonnes in 1983, and 400 million tonnes in 1984 using only 99 million hectares in cultivation. Against this, thanks to good monsoon, India has produced only about 153 million tonnes using about 165 million hectares—i.e. about 1.66 times of land that China uses. There is enough scope for India to produce over 300 to 350 million tonnes of foodgrains using only about 75 to 80 million hectares of land by modernising agriculture very fast through planned application of science and sophisticated technology. There is enough scope for increasing our food production—and level of nutrition of our people—through expansion of animal husbandry, poultry—farming and marine product harvesting etc.

This will need rationalisation of land use, which will also save lot of investment in irrigation and use of



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power. In this respect, it may be worthwhile to study land use laws promulgated by Japan, after the World War-II. As a result of these laws, in 1975, for the first time land price went down by nine per cent of the price in the preceding year.

Land reform and increase in productivity in agriculture, will drastically reduce employment, in agricultural sector, which has happened in all the advanced countries. However, there is nothing to be alarmed as employment will be created in expansion of forestry, industry and services sectors. Forest development will absorb large number of tribal and economically weaker sections of society. Dynamics of development dictates rapid shift in the labour forces from primary, gradually to tertiary sector through secondary sector. Ultimately, largest employer will be the services' sectors, and maximum number will be absorbed in education and health sectors.

India's survival will depend, how fast, she can modernise her agriculture and bring its productivity to the international level. This will need sound industrial back up.

Rapid industrialisation will need extensive use of high technology, keeping in view three major factors; (i) rapid increase in productivity in all sectors of human activities; (ii) economisation of energy input, and (iii) development with conservation of eco-system. These measures will require extensive use of automation in the productive sectors. Automation does not create unemployment, rather, it creates more employment—but in the supporting sectors—which fall under the services sector.

Another factor that should be taken into consideration in planning development that is high technology creates stress and strain, along with increase in productivity. It influences the concept of employment. The old concept of calculating employment in terms of man-hours, man-days and man-years need to be changed to man-production ratio. This has already been done in some countries and also in aviation industry. That is why some countries are thinking of reducing the working hours per week with increase in productivity. This will create more jobs and at the same time will also produce more leisure for an individual worker. This change in the concept of employment will have a tremendous impact on education and training. Education and training will need provision for education for leisure and creativity, and large scale provision for continuing education and training.

In addition, because of the limitation of land with increase of population, Indian society will be a highly urbanised techno-industrial society in the 21st century. This will happen, not by choice, but by compulsion. Such a society will need a revolutionary change in

approach to educational reform. Whether we like or not, more than 70 per cent of the population will migrate to urban areas in the 21st century.

### International Environment

Rapid advancement of science and sophistication of technology have created a unique situation, which has never been faced by mankind in the past. Today, man is standing at the cross-road of two alternatives—(i) follow the present policy of confrontation and total destruction of the world; or (ii) a path of peace and stability based on equity and justice, and thus live in harmony.

In this changing scenario of international environment, education can no more be used as an instrument of exploitation to promote narrow nationalism or religious fundamentalism or any other kind of chauvinism. Instead, education will have to assume the position of an instrument of fundamental change in the human attitude to promote universal brotherhood, unity of man, internationalism and all that which motivate an individual to the philosophy of humanism and peace to bring stability in this world of turmoil.

Before going into the problem of reform of education, it may be desirable to clarify certain fundamental concepts related to education and training.

### Education and Total Learning Process

Although over the years, education has undergone revolutionary changes, it has never been critically studied in relation to the total learning process. Education, training and total learning process are three different concepts, yet many of us still consider education and training as synonymous, whereas they are complementary in the total learning process. Education and Training and their relationship in the total learning process may be expressed by a simple formula,  $L = L_o + L_t + L_e$ , where  $L$  = Total learning process,  $L_o$  = Learning through observation,  $L_t$  = Learning through training,  $L_e$  = Learning through education.

$L_o$ , that is, learning through observation, is the oldest process of learning adopted by all living creatures. It develops power of perception for understanding, what one sees. This process of learning cannot be adopted from one to another situation. However, it may help to transfer certain part of learning for a specific purpose. Take for example, a child observes a cow and learns all about the animal. The child cannot adopt it for learning about another animal say dog. Here a teacher can only act as a guide to correct distortion in the perception of the child, if any. However, a primitive man developed his spear through observation

of horned animals by transfer of learning. Evaluation of this process of learning can only be by testing the perception capacity through method of identification.

Lt, that is, learning through training is a close ended process. The main function of this is to develop physical or mental skills. The essential components of this process are demonstration and practice to develop physical or mental skills. The demonstration may be in the form of actually performing the act as in the case of transfer of physical skills or it may be by repeated reciting of something, in case of transfer of memorising skill. In this process, a teacher takes the role of a trainer. Such learning becomes habit forming and cannot be adopted from one to another situation, without retraining. Take for example, a turner or a miller cannot become an instrument mechanic without retraining as an instrument mechanic. Evaluation of such learning process is by testing of one's skill.

Le, that is, learning through education, which is a very sophisticated form of learning process, is based on accumulated knowledge and experience over the years and is an open ended process with a built-in mechanism for self-growth not only to meet the challenges of the present but also of the future. This process of learning is adaptable in situational changes. Its main function is to develop intellectual and moral abilities. Its evaluation should be based on intellectual achievement. Such process of learning inculcates in an individual scientific temper and spirit of enquiry.

Ideal learning process should be a balanced combination of all the three components. The mix of these should be determined by the objective and purpose, stage, level and the field of study. At the formative stage of a child, the component Lo is the most important for learning. If we critically examine the present institutional learning system, it would be clear that Lo component is practically missing. The present educational system is mostly training oriented, without the physical part of it. That is why, test and qualification become more important in evaluation and not achievement. So we speak of delinking of education from jobs etc. Because of this, our R and D is very weak. Our contribution to fundamental science and new technology is marginal.

### **Education and Communication**

The most important factor which differentiates a man from an animal is the man's power to communicate effectively and efficiently. According to Prof. Rubin Mckie, human beings are genetically identical to chimpanzee and gorillas. The one per cent difference between human beings and them account for all human civilization—art, literature and science. According to

Prof. David Pilleau, a Harvard University anthropologist—"We used to think we are cousins of the apes, now it is becoming clear that we are more like brothers and sisters."

If we critically study the evolution of human society, it would be clear that growth and sophistication in communication is responsible for all human development—art, literatures, science and technology etc. In fact, history of human development is the story of evolution of communication system from sign language to modern sophisticated communication system.

Language is the main vehicle of communication and the script is its prime-mover. Both have undergone revolutionary changes since their birth. The greatest challenge for reform of education is really formulation of a sound, rational and pragmatic language policy, which should be free from narrow nationalism, populism, emotionalism and all types of chauvanism. In formulation a pragmatic language policy, we should keep in mind the needs of our people to march successfully to 21st century according to the changing trends in geo-political and economic environment with the rapid advancement of science and sophistication of technology. It should also keep pace with the explosion of knowledge and information.

We must admit that our present language policy, i.e. three language formula has failed very badly. This can be supported by the results of studies carried so far. A more pragmatic approach should be adoption of two language formula: (i) for communication with the immediate environment—the social environment in which a person lives, and (ii) the language in which a person would have access to maximum information and knowledge to live in a highly sophisticated age of science and technology. Obviously, the two languages should be mother-tongue or the regional language and English in which maximum information and knowledge is being generated in the field of science and technology.

If however, people at large still feel to have a third language to satisfy national pride, such a language should be developed through inter-action of the people of various language groups, as Urdu and Hindustani were developed during muslim rule in India. It would not be difficult to achieve this provided we agree for a common script for all Indian languages. We should not forget that basically India is a continent like Europe having diverse cultures and practices and never was integrated as today except perhaps during the time of Emperor Ashoka for a short period. In fact, Europeans have more common qualities than Indians from various states.

To integrate India into a single unit and change the present picture of statehood into a single nationhood, it is essential to have a single script for all the Indian



languages. Single script will not only provide an individual an easy access to various Indian languages but it will considerably reduce the intellectual load of our children and drudgeries of learning various scripts.

But what should be the national script—should it be devnagari or any other script based on the changing trends in the global environment; in this highly sophisticated age of computer, space and nuclear technology, where time is counted in terms of micro-micro seconds, when within minutes the world can be destroyed. One should not also forget that science and technology, today, have created a very complex situation which may lead to complete annihilation of the solar system, unless a climate of better human understanding and tolerance is created in the mind of every individual human being. Today no person can possibly live in an island of his/her own nor a nation can live in isolation. Today the world is slowly but certainly moving toward a global society based on the 'Unity of Man'. Narrow nationalism, provincialism, regionalism and other types of chauvinism will have to be banished from the earth if world has to survive. There is a need of changing the attitude of people, which can be done only through revolutionary reform of the world education systems. Such reform can only be made by improving the communication system by agreeing to one global language. Whether people like it or not, English language has already assumed this status. Taking into consideration various factors, and if Prime Minister, Rajiv Gandhi and his government are really serious of integrating people of India into a cohesive and compact nation to face the challenges of 21st century, they will have no other alternative but to accept "Roman script", which is not only used as a universal language of computer but is also being used by all languages of the world in which scientific and technical information and knowledge are generated and available, as a common Indian script. The Roman script will not only facilitate for an average Indian an easy access to all Indian languages but ultimately, if the person wants, he/she will have free access to all the other languages of the world, which are generating new knowledge and information related to science and technology.

The "Roman Script" has been well tried during colonial days for training of defence personnel at all levels through Roman Urdu. This had also helped to integrate people joining defence forces from various regions of India.

Introduction of Roman script, as a first step towards forging a common Indian link language besides English will depend upon the courage and strong political will of the political leadership. Here one needs the courage, conviction and will of Mustafa Kamal Pasha (Kamal Ataturk) of Turkey, the successor of the great Ottoman

Empire who introduced "Roman Script" in his country by replacing their age-old script. From the personal experience, one may say that it may be possible for a foreigner to move about freely in Turkey and locate a street or house than for a north Indian to do so in Tamil Nadu to catch a proper bus or to reach a place by his/her own. Besides Turkey, a number of other countries have either adopted or are in the process of adopting "Roman Script".

The next question is the medium of instruction. Here again we need a revolutionary approach. The political leaders who are supposed to be the representatives of the people, must face the realities. Have they ever realised, what an average Indian wants? Everybody wants easy access to maximum information and knowledge. Have they ever pondered why the demand for English medium schools is increasing? Why even a person in rural area, who has little knowledge of the world, wants his/her son or daughter to go to an English medium school? This is because the people of India want to come out of their narrow holes and see the world around, as visualised by Swami Vivekananda, about a century ago.

Our politicians (barring a few), even some intellectuals, have been obsessed with two things, which have affected our development so far : (i) that India lives in villages, therefore, every development activity should be turned to that, no matter, how costly, it becomes both in the terms of time and money, and (ii) that modern technology creates unemployment. Main reason for such an attitude is not because of their ignorance but for their own benefit. Any modernisation means losing their position of power. Therefore they had to adopt the language as a weapon to divide people and feed the population at large with information and knowledge, they want to transmit for their own benefit. Division of the country on the basis of language and thinking on medium of instruction have been influenced by this narrow view of those who were supposed to control the destiny of this country and not on the basis of any rational approach.

Because of the limitation of land and increase in population, more than 70 to 75 per cent of Indian population is going to live in urban areas by 2001 AD. If urbanisation is not planned properly, majority of our people will live in the slum areas and footpaths of major cities. To reduce tension, stress and strain, better communication between people is absolutely necessary for better understanding and development of tolerance. In deciding the medium, one should not forget that proficiency in understanding a language improves with constant interaction and use.

If we have to march into 21st century with efficiency, competence, self-confidence and pride, we must visualise,

what type of society. India is going to be in 21st century, not by voluntary efforts but by compulsion of internal and external forces. This cannot be achieved by simulating a model based on past or present experience. At present, what we do in schools is that we simulate adults' world in schools and break the children from the very beginning to shape them into our own mould, hardly giving them any opportunity to develop their own creative abilities. This cannot be allowed any longer. There is already a crisis of confidence between the two generations.

The medium of instruction, specially at the school-stage should be decided keeping all factors into consideration. We should not underestimate the capacity of our children, whether they belong to rural or urban areas. There is a strong case for adopting bilingual approach in this respect from the very beginning, because

of the gradual change in the environment due to mass media and electronics coming in a big way in our daily life.

Humanities and social sciences may be taught in mother tongue or regional languages in which printed literature is available, but English should be the only medium of instruction for science and technology from the very beginning of education and training for two obvious reasons: one, for continuity in conceptual understanding of science and technology and two, availability of cheap and standard literatures giving up-to-date knowledge and information. It should not be forgotten that English is today not only mother tongue of the English speaking world but it is also the mother language of science and technology and is an international lingua-franca.

[To be concluded]



## NATIONAL INSTITUTE OF EDUCATIONAL PLANNING AND ADMINISTRATION

17-B, Sri Aurobindo Marg, New Delhi-110016

Applications are invited for the following post :

**Fellow (School & Non-formal Education Unit)**

Rs. 1200-50-1300-60-1900 (Two posts—One of the posts will be filled up w.e.f. 1.10.86).

### (a) Qualifications Essential

- (i) Should have consistently good academic record with first or high second class (B+) Master's degree in Education, Social Sciences or disciplines allied to Educational Planning and Administration or an equivalent degree of a foreign university.
- (ii) Either a doctorate degree of an Indian or foreign university or published research work of a high standard or outstanding academic contribution in the field of school education; and
- (iii) Atleast 5 years' experience of teaching/conducting and/or guiding research in fields relating to educational planning and administration.

OR

Atleast 5 years' administrative/professional experience in Government in relevant field.

- (iv) Proven literary merit in writing/editing/documentation/publication work.

### Desirable

Experience in conducting training in school, non-formal and adult education.

**Note :** The condition regarding Ph.D. will not apply

in case of persons drawn from administrative cadres but there should be evidence of academic and innovative contribution in the field of Educational Planning and Administration. It will be open to persons serving in government departments to join the post on usual deputation terms.

**Age :** Below 45 years.

The posts carry the usual allowances as are admissible under the Central Government rules plus HRA payable at 20% as per rules.

Applications with full bio-data particulars alongwith attested copies of certificates, a recent passport size photograph and a non-refundable crossed postal order of Rs. 8/- (in the case of Scheduled Caste/Scheduled tribe candidates, no postal order is required), endorsed in favour of the Registrar, NIEPA, 17-B, Sri Aurobindo Marg, New Delhi-110016, should reach the undersigned latest by **9.5.1986**.

Qualifications and age are relaxable for otherwise well qualified candidates. Candidates from outside Delhi called for interview will be paid single return second class train fare. Candidates already in employment in Government/Semi-Government Departments / Autonomous Bodies may send their applications through proper channel. Other things being equal, preference will be given to Scheduled Caste/Scheduled Tribe candidates.

New Delhi

Dated 3.4.1986.

**R.P. Saxena**  
**REGISTRAR**

MMG

# UNIVERSITY GRANTS COMMISSION

## Junior Research Fellowship Examination, 1986

1. The University Grants Commission will hold a national level examination on **Sunday the 3rd August, 1986**, as an eligibility condition for consideration for the award of Junior Research Fellowship from out of the fellowships already allocated to the Universities under the general scheme or under various quality programmes such as Centres of Advanced Study, Departments of Special Assistance, Major Research Projects, Area Studies, etc.

2. **VALUE** : The value of the fellowships is Rs. 1,000/- per month and the ceiling of contingency grant is Rs. 5,000/- per annum for science and engineering subjects and Rs. 3,000/- per annum in the humanities and social sciences. The amount of contingency grant could also be enhanced to Rs. 5,000/- p.a. for the humanities and social sciences, depending upon the nature of the programme.

### CONDITIONS OF ELIGIBILITY

(i) Candidates preferably below the age of 30 years (40 years in case of women candidates) on the date of the test who have secured a second class Master's degree are eligible for this examination. (ii) Candidates who have appeared or will be appearing in M.A./M.Sc./M.Com. examination and whose result is still awaited or candidates whose examination have been delayed may also apply for this examination. However, such a candidate will be considered for the award of fellowship only after he/she qualifies the examination and fulfils the conditions under (i) above. (iii) Persons already in receipt of UGC fellowship or any other fellowship funded by the University Grants Commission may also apply for appearing at the examination provided they fulfil the conditions under (i) above. Such of these candidates who qualify in the examination, may be considered for enhancement

of value of their fellowship and contingency grant. (iv) Candidates who intend to carry out research in one of the subjects in which the examination is being held, but possess the required educational qualification in a related subject may also apply. If such a candidate qualifies at the examination, he/she would be considered for award of Junior Research Fellowship according to the registration rules of the concerned University, in the subject in which he/she has appeared at the examination.

3. The subjects of the examination have been divided into two categories viz: Category 'A' and Category 'B'. The subjects under each category with the respective scheme of examination are given below:

### CATEGORY 'A' SUBJECTS

Sl. No.	Name of the Subject	Code No.
1.	Physics	01
2.	Chemistry	02
3.	Mathematics	03
4.	Life Sciences (Botany, Zoology, Bio-chemistry, Genetics & Microbiology)	04
5.	Geology	05
6.	Geography	06
7.	Economics	07
8.	Political Science	08
9.	Philosophy	09
10.	Psychology	10
11.	Sociology	11
12.	History	12
13.	Anthropology	13
14.	Commerce	14
15.	Education	15
16.	Statistics	16
17.	Assamese	17
18.	Bengali	18
19.	Gujarati	19
20.	Hindi	20
21.	Kannada	21
22.	Malayalam	22
23.	Marathi	23
24.	Oriya	24
25.	Punjabi	25

26.	Sanskrit	26
27.	Tamil	27
28.	Telugu	28
29.	Urdu	29
30.	Arabic	30
31.	English	31
32.	French	32
33.	German	33
34.	Persian	34
35.	Spanish	35
36.	Russian	36
37.	Linguistics	37

The examination in the above 37 subjects will consist of two papers as detailed below :

	hours	marks
(i) A general paper to test the research aptitude of the candidate- <b>PAPER-I.</b>	2	200
(ii) A paper in one of the 37 optional subjects mentioned above to test the proficiency of the candidate in the subject concerned- <b>PAPER-II</b>	3	300

Each subject in this category, includes all the branches of specialisation of the respective subject. For instance, Chemistry includes all the specialisations of the subject viz : Physical, Inorganic, Organic, Analytical etc.

### CATEGORY 'B' SUBJECTS

#### Code No. 38

This will include all the remaining subjects in which the Universities offer courses at the Master's degree level. The examination in these subjects, will consist of one written paper and interview in the concerned subject as indicated below :—

	hours	marks
(i) General paper to test the research aptitude of the candidate <b>PAPER-I</b>	2	200
(ii) Assessment of the personality, academic		300



record etc. in the optional subject under Code No. 38, at an interview by an expert or group of experts appointed by the Commission.

4. Candidates have the option to answer Paper-I (General Paper) and Paper-II in Physics, Chemistry, Mathematics, Life Sciences, Geology, Geography, Economics, Political Science, Philosophy, Psychology, Sociology, History, Anthropology, Commerce, Education, Linguistics and Statistics either in Hindi or in English. Candidates should note that the medium of answering Paper-I and Paper-II in these optional subjects has to be the same for all the questions. In the remaining subjects the medium of answering Paper-II will be as per instructions given in the question paper.

5. The examination will be held at the University Centres specified below. A candidate should, however, register himself/herself only at such a centre where facilities for research and/or teaching at the post-graduate level exist in the subject in which he/she is appearing at the examination. In cities having more than one University but only one test centre, candidates may register themselves at that centre for all subjects where facilities for research and/or teaching at the post-graduate level exist in any of the Universities in that city.

**Change of centre will not be allowed under any circumstances. List of University Examination Centres**

1. Agra University
2. Aligarh Muslim University
3. Allahabad University
4. Amravati University
5. Andhra University
6. Annamalai University
7. Avadh University
8. Banaras Hindu University
9. Bhavnagar University
10. Bharathiar University
11. Bharathidasan University

12. Bhopal University
13. Bihar University
14. Bombay University
15. Bundelkhand University
16. Calcutta University
17. Calicut University
18. Cochin University
19. Delhi University
20. Dibrugarh University
21. Devi Ahilya Vishwavidyalaya
22. Dr. H.S. Gour Vishwavidyalaya
23. Gauhati University
24. Gorakhpur University
25. Gujarat University
26. Jamnu University
27. Jiwaji University
28. Jodhpur University
29. Kakatiya University
30. Kalyani University
31. Kanpur University
32. Kashmir University
33. Kerala University
34. Kumaon University
35. Kurukshetra University
36. Lucknow University
37. L.N. Mithila University
38. Madras University
39. Madurai Kamraj University
40. Magadh University
41. M.D. University, Rohtak
42. Mangalore University
43. Marathwada University
44. Meerut University
45. Mohanlal Sukhadia University
46. Mysore University
47. Nagarjuna University
48. Nagpur University
49. North Eastern Hill University
50. North Bengal University
51. Osmania University
52. Patna University
53. Poona University
54. Ravi Shankar University
55. Rani Durgavati Vishwavidyalaya
56. Rohilkhand University
57. Roorkee University
58. Sardar Patel University
59. Saurashtra University
60. Shivaji University
61. South Gujarat University
62. Sri Krishnadevaraya University
63. Sri Venkateswara University
64. Utkal University
65. Vikram University
66. Visva Bharati
67. Bangalore University

68. Guru Nanak Dev University
69. Himachal Pradesh University
70. M.S. University of Baroda
71. Ranchi University
72. Panjab University
73. Burdwan University
74. Awadhesh Pratap Singh Univ.
75. Manipur University
76. Karnatak University
77. Rajasthan University
78. Bhagalpur University

6. **HOW TO APPLY :** Candidates should apply in the application form given below and send the application to the Registrar of the University, selected as examination centre by the candidate. It should be clearly specified on the envelope as well as on the top of the application form that the application is for UGC Junior Research Fellowship Examination, 1986. Before sending his/her application form to the University for registration, the candidate should satisfy himself/herself that the University concerned has research and/or teaching facility at the M.A./M.Sc./M.Com. level in his/her subject of the examination. **The last date for registration of candidates is 5th May, 1986.**

7. Candidates found eligible to take the examination will be issued call letters and the necessary information regarding syllabus, sample questions etc. will be supplied to them by the University where they have registered themselves for the examination.

8. **GENERAL :** (i) Before submitting the application, candidates are advised to satisfy themselves that they fulfil all the eligibility conditions as laid down for admission to the examination. (ii) The candidates should note that in case (a) their M.A./M.Sc./M.Com. examination result is not declared they should write 'result awaited' and (b) if the examination is not held, they should write 'examination delayed' in item No. 10 of the application form and also enclose a certificate from the Head of the Department/College concerned that he/she has completed the requirements for appearing in the

final examination (iii) A recent pass-port size photograph, duly signed by the candidate and attested by the Head of the Department/Institution last attended/Class-I Officer/a Professor of University, should be affixed on the right hand top corner of the application form. (iv) The examination fee of Rs. 10/- in the case of general candidates and Rs. 2.50 in case of SC/ST candidates should be paid in the form of a crossed bank draft payable to the Registrar of the University chosen by the candidate as his/her centre for the examination. (v) Fees once paid will not be refunded. (vi) Copies of certificates, mark sheets, testimonials, should NOT be sent alongwith the application. (vii) The candidates will take the test at their own expense. (viii) Application should be neatly hand written/typed in English or Hindi. (ix) Application complete in all respects alongwith (a) Crossed Bank Draft, (b) Two self-addressed unstamped envelopes of 23 x 12 cm. size and (c) SC/ST certificate from the competent authority (in the case of SC/ST candidates) should be sent to the Registrar of the University selected by the candidate as his/her examination centre in a cover superscribed as APPLICATION FOR UGC JUNIOR RESEARCH FELLOWSHIP EXAMINATION, 1986. No other enclosures be sent with this application. (x) The last date for receipt of applications is : 5th May, 1986. Applications received after this date will not be entertained. Candidates are, therefore, advised in their own interest to apply early enough to ensure timely receipt of their applications by the University Centre. (xi) An application not accompanied by the prescribed fee or not in the prescribed proforma or incomplete in any respect, will not be entertained.

**NOTE :** The UGC may change the Centre or date of Examination without assigning any reason. Canvassing in any form will disqualify the candidate.

# **UNIVERSITY GRANTS COMMISSION** **JUNIOR RESEARCH FELLOWSHIP EXAMINATION, AUGUST, 1986** **PROFORMA FOR APPLICATION**

## **IMPORTANT :**

- (i) Affix your photograph duly attested.
- (ii) Enclose the bank draft for fees, and
- (iii) Enclose SC/ST certificate, in case you belong to SC/ST Community.

Affix recent pass-port size photograph duly attested and signed by the candidate.

(To be filled in by the University)

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Roll No. :

1. Name in CAPITAL letters : Sh./Smt./Km. \_\_\_\_\_  
(write your surname first e.g. if the name is Avinash Kumar Gupta, write it as GUPTA AVINASH KUMAR)

Surname      Name

2. Date of Birth : \_\_\_\_\_  
(For example, write 12th March, 1962 as 12 03 1962)

Day      Month      year

3. Father's/Husband's name : \_\_\_\_\_
4. Address for communication : \_\_\_\_\_  
(Give Pin-Code). \_\_\_\_\_
5. Do you belong to SC/ST ? YES/NO
6. Are you a Blind Candidate ? YES/NO
7. Optional Subject for Paper-II Subject Code No. ☐
8. Medium offered for answering :

(i) Paper-I

(ii) Paper-II-Optional subjects : Physics,

Chemistry, Mathematics, Life Sciences,

Geology, Geography, Economics, Political

Science, Philosophy, Psychology, Sociology,

History, Anthropology, Commerce, Education,

Statistics & Linguistics.

ENGLISH/HINDI

**NOTE :** The medium of answering question paper in the remaining subjects will be as per instructions given in the question paper concerned.

9. Centre for Examination : \_\_\_\_\_ University.
10. Details about Post-graduate Examination :

Name of Examination	Name of Univ.	Division/Grade	% of marks
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11. Particulars of Bank Draft : Rs. 10/- for General Candidates  
Rs 2-50 for SC/ST Candidates.

Name of Bank	No. & date of Bank Draft	Value: Rs. Ps.
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## DECLARATION BY CANDIDATE

I hereby declare that I am an Indian national and all statements made in this application are true, complete and correct to the best of my knowledge and belief. I understand that in the event of any information being found false or incorrect, my candidature for Junior Research Fellowship Examination, 1986 is liable to be cancelled.

Place : \_\_\_\_\_

(Signature of Candidate)

Date : \_\_\_\_\_

List of Enclosures: 1. Crossed Bank Draft. 2. Two self-addressed unstamped envelopes 3. Scheduled Caste/Scheduled Tribe Certificate. (For SC/ST Candidates only).

# Dr. Qasim Addresses Convocation of School of Planning and Architecture

Excerpts from the Convocation Address delivered by Dr. S. Z. Qasim, Secretary, Department of Ocean Development, Govt. of India, at the School of Planning and Architecture, New Delhi, on April 4, 1986.

"... Since the dawn of civilisation, planning and architecture have been an integral part of human way of life. In fact, the degree of fulfilment of man's aspiration, the extent of his aesthetic sense are reflected in planning and architecture of a building, a garden, a drainage system, a layout plan for a township, a city or a village around which his life is centered. From the ruins of Mohenjodaro and Harappa, one notices the scientific way in which the drainage system, the walls, the buildings in these cities were constructed to allow the people to live a healthy life and to carry on the necessary functions of a civilised society. It was also true in the case of the Roman

become more and more complicated, as more and more modes of transport have been introduced, as more and more commitments have been demanded of men to meet their various increasing social obligations with the results that the trend of planning and architecture has also undergone more and more drastic changes. Today, new concepts are emerging in education, in social life, in political standards and ethos. Newer technologies are coming up. All these are making human living not only of a more complex nature but also inter-dependent. Naturally, therefore, in planning buildings, towns, villages and cities, one has to take note of the dynamic changes and the

## Convocation

Civilisation from the ruins of which one gathers how scientifically the planning was done for buildings, gardens, amphitheatres, community halls, places of worships, etc. It, therefore, shows that even more than 2,000 years ago, people knew the importance of planning and architecture. Their relevance to the society and their influence in shaping the life style of the people was not as much in the olden days as it is today.

The responsibilities of the Architects and Planners have increased many times since the days of Greek and Roman Civilisations. Life has

spirit and the rationale behind them.

Today we find human society plagued with the problem of population explosion, thanks to the decreasing mortality rate. Because of greater employment opportunities in towns and cities, rural population is migrating towards cities in search of jobs. All these have led to human upsurge in cities and towns upsetting the hitherto existing balance between rural and urban populations. This has caused the necessity for reorientation of outlook of both engineers and architects. To tackle the increasing urban population, skyscrapers and high-rise buildings are coming up in

greater numbers. While it may thus appear possible to solve at least for the present the problem of accommodation for the rising urban population, several other problems inevitably arise. Thus the high-rise structures are preventing more and more fresh air and sunlight reaching small houses in the neighbourhood. The result is that the health standard of less-privileged but more numerous human beings is getting affected. Increasing population and limited space are also forcing the town planners to keep less and less of open space in the form of parks, gardens or nurseries. A good town planner has to ensure that his planning should be such that man's bond with nature does not get snapped.

I agree that when Mr. Edwin Lutyens designed New Delhi and more recently when Mr. Le Corbusier planned Chandigarh, the problems were not so acute as these are today. Let me warn you that the problem will be much more acute in the coming years when you have to plan for the 21st Century. The rule of thumb before you should be to utilise the minimum possible space to accommodate the maximum number of people without compromising the requirements of a healthy living. Ever since man has arrived on this planet, a link has grown between him and nature. Please see that in our eagerness to erect nice-looking structures, we do not destroy this nexus and in the process irritate man and distort nature.

I am glad to learn from one of your Annual Reports that in December 1982, your School organised a Workshop on Energy and Habitat. This workshop, I understand, was conceived in the context of growing need for energy conservation which is an important economic necessity. Today there is a crisis of energy and all of us know that conservation of energy should be of prime



importance if human society is to survive this crisis. In our future plans for the structural design of urban areas, our villages remain side-tracked. While the high-rise buildings and automobiles in the cities consume energy on a large scale, the rural population has little or no access to the commercial source of energy. In discussing the role of town planning in the present day society, special emphasis has to be laid on devising ways and means for energy conservation. In the construction of buildings, energy consumption depends upon the choice of building material and building technology. The design for a building should be such that the amount of energy to be consumed during the life span of the building should be minimal, at the same time providing a comfortable in-door environment. The design should be such that recycling of energy is possible to the maximum extent.

Next comes the importance of prevention and control of pollution. Planners of future buildings have to play a crucial role in tackling this increasing problem as it is not only confined to the cities but has also gradually come to the villages. The problem will become more and more acute with the rising pace of industrialisation. Therefore, the architect of a factory building would have to ensure that the chimnies and other outlets for the fumes and gases are so constructed that they are carried high into the atmosphere and do not settle down immediately and pollute the surrounding environment. When I am talking about the architects or planners, I am not only referring to the architects and planners related to civil engineering. My advice is also to the mechanical and electrical engineers. The tragedy which occurred among the innocent people of Bhopal due to gas leakage from the Union Carbide Factory could have been perhaps avoided if

the planning of the factory outlets vis-a-vis the living areas around the factory were planned a little more carefully and if the possible hazards of gas leakage were envisaged in time.

Today we hear a lot about the conservation of ecosystems. Here also we have to think about the inseparable linkage between man and his overall environment. The planners of town particularly in coastal areas, where towns are located on the sea-shore or on the banks of a river or near an estuary have to remember that the natural ecosystem should not be disturbed as far as possible. An architect or a town planner has to take notice of this ecosystem and also the geographical location of the particular place of construction. Naturally his methodology and designs will vary with the nature of the location. Similarly another type of approach is to be adopted in case the area of construction happens to be in an arid or semi-arid zone or in an area where the monsoons are heavy. He has also to take note of the fact whether the place of construction is near a river or the sea, on the plains or in the hilly region. He has obviously to take note of the patterns of the surroundings and the nature of the soil and the sub-soil. These are

common things for which I need not give any advice to my expert friends. But at the same time, I would like to extend a note of caution here. In our zest for more and more construction we should not forget that the normal ecosystem should be left undisturbed to the extent possible. Deforestation should be avoided unless it becomes inevitable and cannot be helped.

An architect, planning for any construction, has also to take note of history, culture and traditions of a place. For example, we know that in South India, towns have grown around temples. Thus in putting up any large scale construction in a South Indian town an architect should not be oblivious of this fact and should, as far as possible, plan the buildings, gardens, etc. in such a way that some features or the style of the temples are not ignored.

I would like to tell you here that the power of imagination more than anything else, plays an important part in the work of an architect or a town planner. Power of imagination is the stimulus behind any art or science or religion. It is the creativity that becomes the centre of imagination. Successful inter-human relationship is also the result of creative thinking... □

## Literacy Situation in the World

In 1985 there were an estimated 3,203 million persons aged 15 years and over in the world: 2,314 million literate, and 889 million illiterate. The 889 million illiterate persons represented more than a quarter of the world's adult population. Of these 889 million illiterates, 328 million were males (about one in five of all adult males), and 561 million were females (more than one in three of all females aged 15 years and over). All but 20 million of

these illiterates were to be found in the Developing Countries. When analyzed by continent, Asia with 660 million illiterates accounted for 75 per cent of the world's total, Africa with 162 million for a further 18 per cent and Latin America and the Caribbean with 44 million accounted for another 5 per cent.

*[Extracts from the Document prepared by UNESCO, Paris, July 1985.]*

# NATIONAL METALLURGICAL LABORATORY

## (Council of Scientific & Industrial Research)

JAMSHEDPUR-831007.

NML ADVERTISEMENT No. 1/86

Applications are invited to fill up the following vacancies at the National Metallurgical Laboratory, (NML), Jamshedpur-831 007, in the grades and disciplines mentioned against each :

### 1. SCIENTISTS

#### CATEGORY-I : SCIENTIST 'EP' (Rs. 1500-60-1800-100-2000)

**5 posts** available in the areas of : instrumentation and electronics; planning, monitoring and evaluation; technology utilisation; heat and mass transfer; refractories; corrosion engineering; process-engineering; project-engineering; mineral science and engineering.

##### Essential

In relevant fields First Class Bachelor's Degree in Engineering/First Class M.Sc. Degree with 12 years of R&D experience in any of the above mentioned areas.

OR

In relevant fields Post Graduate Degree in Engineering/Ph.D. in Science with 10 years of R&D experience in any of the above mentioned areas.

N.R.: Candidates with truly exceptional credentials can be considered for higher scale/post.

#### CATEGORY-II : SCIENTIST 'C' (Rs. 1100-50-1600) **9 posts** available in the areas of computer applications; project monitoring and evaluation; technology utilisation; instrumented chemical analysis; mechanical metallurgy; thermodynamics of extractive metallurgy; electronics/instrumentation; foundry; corrosion.

##### Essential

In relevant fields First Class Bachelor's Degree in Engineering/First Class M.Sc. Degree with 6 years of R&D experience in any of the above mentioned areas.

OR

In relevant fields Post Graduate Degree in Engineer-

ing/Ph.D. in Science with 4 years of R&D experience in any of the above mentioned areas.

OR

Ph.D. (Engineering).

#### CATEGORY-III : SCIENTIST 'B'/'BP' (Rs. 700-40-900-EB-40-1100-50-1300)

**4 posts** available in instrumentation/electronics; corrosion; material science; production engineering; mechanical metallurgy; numerical analysis; analytical chemistry.

##### Essential

In relevant fields First Class Bachelor's Degree in Engineering/First Class M.Sc. Degree.

OR

In relevant fields Post Graduate Degree in Engineering/Ph.D. in Science.

#### SCIENTIST 'C'

### 2. (EXECUTIVE ENGINEER) (Rs. 1100-50-1600)

**1 post** available.

##### Essential

First Class Bachelor's Degree in Civil Engineering with 6 years experience in construction work.

OR

M.Tech. in Civil Engineering with 4 years experience in construction work.

### 3. LIBRARY OFFICER

(Rs. 700-40-900-EB-40-1100-50-1300)

**1 post** available

##### Essential

First Class Bachelor's Degree in Library Science with 6 years experience in a reputed Library.

OR

Master's Degree in Library Science/M.Sc. with 4 years experience in a reputed Library.

#### 4. JUNIOR TECHNICAL ASSISTANTS

(Rs. 425-15-500-EB-15-560-20-700)

5 posts available in instrumentation/electronics.

##### Essential

B.Sc./Diploma in Engineering/Technology of 3 years duration or equivalent preferably with about 3 years experience in handling/maintaining sophisticated equipments such as Scanning Electron Microscope (SEM), X-ray Diffractometer (XRD), X-ray Fluorescence (XRF), Differential Thermal Analyzer (DTA), Dilatometer, Oscilloscopes as well as in comprehending the LSI & VLSI circuits.

computer applications in metallurgical engineering/mechanical behaviour/corrosion/ high temperature properties/ceramics/phase transformation/solidification/heat and mass transfer/ thermodynamics and kinetics/mineral science/ reliability/project planning and management/ project engineering.

##### Eligibility

M.Sc. First Class/B.Tech. First Class.

#### GENERAL INFORMATION

#### 5. RESEARCH ASSOCIATES (Consolidated emoluments will be between Rs. 1400-2000 depending on credentials).

A few positions on a temporary basis (1-2 years) are available in the areas of computer applications in metallurgical engineering/mechanical behaviour/ corrosion/high temperature properties/ceramics/ phase transformation/solidification/heat and mass transfer/thermodynamics and kinetics/mineral science/reliability/project planning and management/ project engineering.

##### Eligibility

The potential candidates should possess M.Tech. or Ph.D. in Engineering with 3 years R&D experience after M.Tech.

OR

Ph.D. in Science with a uniformly brilliant academic record and proven record of R&D work.

(1) Posts 1-4 carry usual allowances as admissible under the Central Government rules. Research Associates, SRF & JRF are entitled to consolidated amounts only, plus the usual 15% House Rent Allowance and medical benefit.

(2) Advance increments for candidates will be considered by the Selection Committee on the basis of their credentials.

(3) Application form for all the posts are obtainable by post (free of cost) from the administrative Officer, National Metallurgical Laboratory, Jamshedpur-831007, before 5th May, 1986 by sending a self-addressed and stamped envelope (Re. 1.10 paise) of 28 x 13 cm. Completed application forms together with non-refundable application fee of Rs. 8.00 (Rs. 2.00 for Scheduled Caste/Scheduled Tribe candidates) in the form of Crossed Indian Postal Order, drawn in favour of the Director, National Metallurgical Laboratory, Jamshedpur-831007, alongwith attested copies of certificates/ testimonials etc., should reach the Director, National Metallurgical Laboratory, Jamshedpur-831007, on or before 26th May, 1986. **Candidates applying for more than one post should submit separate applications alongwith the prescribed application fee specifying no. of advertisement and post applied for. Incomplete applications and those received after the last date will not be considered.**

(4) Details of the job description/requirement will be made available alongwith the 'Application Form' on request including general conditions of service.

(5) Reservation of posts for Scheduled Caste/Scheduled Tribe communities are available as per rules, for the posts in the grade of Rs. 700-1300 and below.

#### 6. (a) SENIOR RESEARCH FELLOW (Rs. 1200/- per month)

A few positions are available in the areas of computer applications in metallurgical engineering/ mechanical behaviour/corrosion/ high temperature properties/ceramics/phase transformation/solidification/heat and mass transfer/thermodynamics and kinetics/mineral science/ reliability/project planning and management/ project engineering.

##### Eligibility

M.Tech./Ph.D.

#### (b) JUNIOR RESEARCH FELLOW (Rs. 800/- Rs. 1000 per month)

A few positions are available in the areas of



# M.P. Young Scientists Congress

Devi Ahilya Vishwavidyalaya, Indore, organised the first meet of M.P. Young Scientists Congress on February 22-24, 1986 to initiate the Young Scientists Promotion Scheme (YSPS). This scheme has been jointly sponsored by the Department of Science & Technology (DST), Govt. of India and the M.P. Council of Science & Technology (MAPCOST), Bhopal. The MAPCOST has earlier initiated a scheme whereby students upto higher secondary level compete in a written science quiz test and the meritorious students are offered scholarship of Rs. 100/- per month for a period of 3-5 years which helps them to continue their studies. The present YSPS is, in fact, a follow up programme.

## Salient features of the scheme

Any student/teacher who is below 30 years in age and has been working in an institution of science and technology including Engineering, Medical, Dental and Agriculture in the state of M.P. is eligible to participate in this scheme. The participant is required to submit a research paper in his/her name alone; joint authorship with senior persons disqualifies the candidate. Selected candidates are invited to present their paper in the presence of experts. The experts hold probing discussions with the authors and then prepare a merit list of those participants whose papers are found to be up to the mark. The selected candidates can spend upto two months in any institution in India for the following purpose :

- (i) Consultation / guidance with experts in their field.
- (ii) To attend specific course of lectures on topics pertaining to their research activity.
- (iii) Use of more sophisticated instruments, library and computer facilities.

They will be paid TA/DA for such visits. Proposal to give certificates of merit and/or medals to the selected candidates is under consideration. The special merit of this scheme is three fold.

- (a) It brings together young and promising students from the various disciplines under science & technology, including Medical and Agriculture. This increases the possibility of doing interdisciplinary work.
- (b) The award is academic in nature in the sense that it allows young scientists to avail of the best facilities in terms of manpowers, equipment and library which are available in our country.
- (c) Insistence on single authorship develops self confidence in the younger workers and gives them due credit.

## First meet under YSPS

The first meet under this scheme was inaugurated by Prof. K.M. Chandy, Governor of M.P. on 22 February 1986 at Indore. Dr. P.K.

Iyengar, Director of Bhabha Atomic Research Centre, Bombay gave two key-note addresses in the vital field of Energy. The academic programmes were held in two parallel sessions :

### A. Physical Sciences

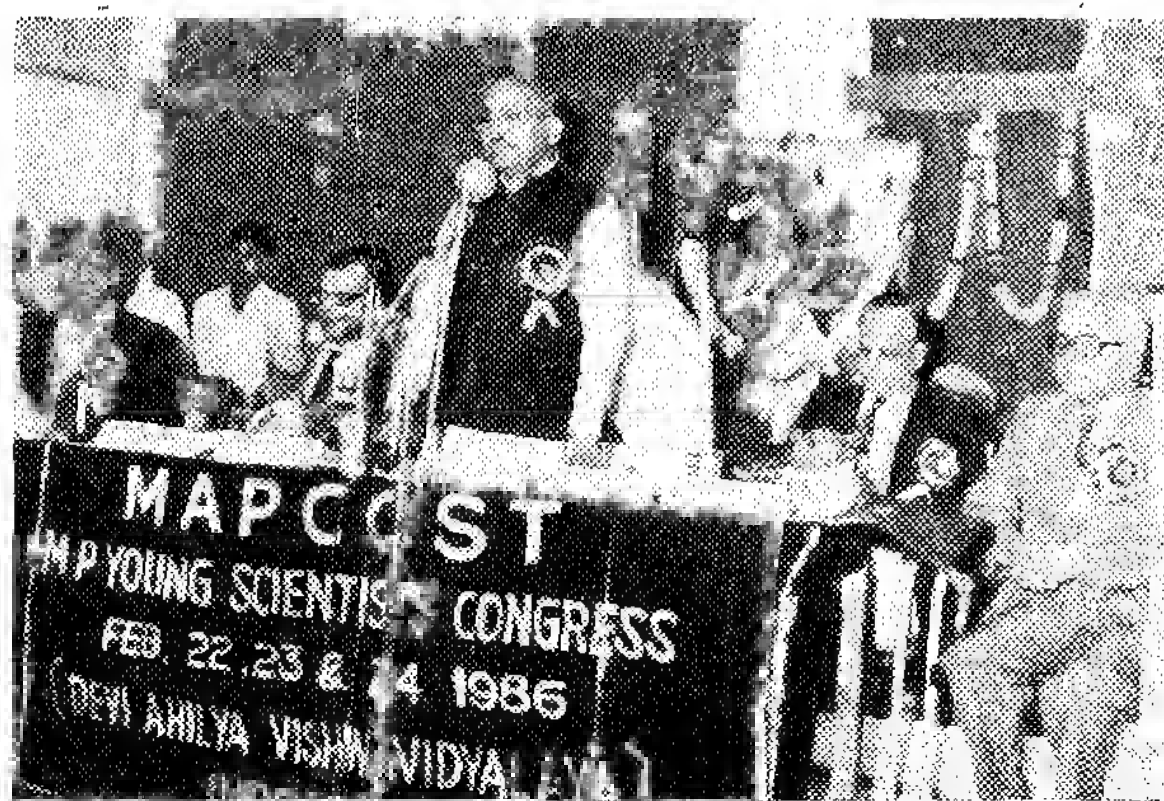
This included papers in Physics, Chemistry, Mathematics, Statistics, Geology, Geophysics and all branches of Engineering.

### B. Biosciences

This included papers in Botany, Zoology, all branches of Life-Sciences, Biochemistry, Medical, Dentistry, Veterinary, Geography and Agriculture.

This being the first year of implementation of YSPS, only 33 papers in the physical sciences group and 28 papers in the Biosciences group were received. The Scheme is sure to pick up in the coming years. As a policy these meets will be organised every year by different universities of M.P.; the next meet will be organised by the Bhopal University.

In all the subjects where number of eligible participants was 4 or



*Prof. K.M. Chandy, Governor of Madhya Pradesh, inaugurating the M.P. Young Scientists Congress at Indore.*

more, 3 experts had been invited—two from outside of M.P. and one from M.P. Universities. In some cases, because of last minute difficulties in getting the experts, this rule had to be modified suitably.

Out of a total of 61 research papers received, 14 candidates were selected under this scheme. The selected candidates have been asked to choose an institution, in consultation with their guide and taking into consideration the remarks of the experts, where they would like to go to utilise better personnel and material facilities. This will enable the young scientists of Madhya Pradesh to come in contact with distinguished national scientists in their field. It is hoped that the YSPS will encourage young scientists to do better research work.

### **University of Health Sciences for Andhra Pradesh**

The Government of Andhra Pradesh has decided to establish a University of Health Sciences for whole of the State. A Bill to this effect has recently been passed by the State Assembly. The Bill provides for the establishment and incorporation of teaching and affiliating university with a view to achieving uniformity in curricula and the standards of medical education, ensuring efficient and systematic education, training and research on the allopathic and indigenous systems of medicine, dentistry, pharmacy and nursing.

All the 22 medical colleges, 9 allopathic colleges, one dental college, 4 ayurvedic colleges, 2 unani colleges, 3 homoeopathic colleges and three nursing colleges which are now affiliated to different universities in the State would now come under the jurisdiction of this new university.

### **M.Sc. in Computer Science**

Mysore University proposes to introduce MSc course in Computer

Science in collaboration with the Research Wing of Union Ministry of Defence with effect from the current academic session. The estimated cost of the scheme would be around Rs. one crore. The initial intake to the course would be between 20 and 50.

### **Open University in Bihar**

The Government of Bihar has decided to set up an Open University in the State. The University, it is reported, is likely to be located at

Nalanda. A sum of Rs. 2 crores has been sanctioned to meet the initial expenses. Detailed modalities of its establishment, statutes and teaching guidelines are being worked out.

The University is expected to start functioning in about six months time.

### **BEd by correspondence**

Nagarjuna University, Guntur, is reported to have agreed, in principle, to start correspondence course in B.Ed. training.

## **News from Agril. Varsities**

### **Safe use of farm machinery**

The Extension Training Unit of the College of Agricultural Engineering of the Punjab Agricultural University organized a two-day training course in "Safe Use of Threshers and Operation and Maintenance of Combine Harvesters" on April 3 & 4, 1986. Twenty-one participants from the State Department of Agriculture, including two senior officers of the Engineering Section, attended the course.

Dr. K.S. Nandpuri, Director of Extension Education of the University while addressing the participants said that farm machinery had played a significant role in increasing the food production of Punjab. The farmers of Punjab had invested more than rupees one crore on farm machinery and it is important that they should learn its proper use and maintenance. In view of the labour shortage the farmers have to depend upon threshers and combine harvesters for harvesting wheat and on paddy planters for timely transplanting of paddy seedlings.

Dr. S.R. Verma, Dean of the College of Agricultural Engineering

said that in view of improper designs of farm machines and poor maintenance, their efficiency was only 45 per cent. He cautioned that no thresher should be used without a safety device to avoid thresher accidents, and informed that District Extension Specialists (Farm Machinery) at district levels were being appointed to educate the farmers about the proper use and upkeep of farm machinery.

### **Nehru Award to Pantnagar scientist**

Narsimham Merit Award winner, Dr. Jatinder Kumar of the G.B. Pant University of Agriculture and Technology, Pantnagar has been awarded the 1984 "Jawahar Lal Nehru Award" by the Indian Council of Agricultural Research in recognition of his fundamental contributions to the understanding of the misconceptions associated with etiology, spread and management of the malformation disease of mango, which is considered as one of the most threatening disease of the recent times and causes substantial loss to mango fruit yield in India and other countries.

Dr. Kumar had experimentally demonstrated for the first time that the two symptoms, vegetative and floral malformations, are two different stages of the same disease and that the disease involves working of malformation inducing principle and toxic principle. The rapid spread of the disease in young orchards during recent years, according to him was due to indiscriminate use of scions from infected trees for vegetative propagation. Dr. Kumar has recommended the use of scion shoots from healthy trees to check the introduction of disease in new plantations. Dr. Kumar has also maintained that control measures like extraneous application of growth regulators, fungicides, insecticides, micronutrients etc. are not effective against the disease. However, practices like pruning of infected twigs and deblossoming of malformed panicles may be helpful in reducing the disease severity.

The award carries a citation.

gold medal and a cash prize of Rs. 5,000/-.

### Awards for HAU scientists

I.C.A.R. award for team research in Agriculture for the biennium 1983-84 has been awarded to Dr. R.S. Paroda and his thirteen associates of Haryana Agricultural University for their research contribution made through interdisciplinary team work in the field of forage sorghum improvement and utilization.

Dr. Paroda, who at present is the Director of National Bureau of Plant Genetic Resources, New Delhi, has been the Additional Director of Research of Haryana Agricultural University. The other scientists in the team are Dr. G.P. Lodhi, Dr. S.K. Arora, Dr. O.P. Dangi, Dr. R.P.S. Grewal, Dr. Y.P. Luthra, Sh. H.A. Ram, Sh. J.N. Joshi, Sh. D.S. Rana, Sh. K.D. Taneja, Dr. P.C. Gupta, Dr. S.K. Gandhi, Sh. S.P. Singh and Sh. S.S. Karwasra.

The outstanding contributions

made by the inter-disciplinary team of these scientists have brought tremendous advancement in forage sorghum production and productivity in the country through the development of three varieties of forage sorghum (HC 136, Meethi Sudan and Haryana Chari) and their release at the national level. The team also provided leadership and coordinated the work on forage sorghum at the national level since 1971.

\* \* \*

The coveted Rafi Ahmed Kidwai Memorial Prize for Agricultural Research for the biennium 1980-81 has been jointly awarded to the four Haryana Agricultural University scientists led by Dr. R.P. Kapil. The award to Dr. Kapil and his associates has been made for their outstanding contribution in the field of Entomology. Dr. Kapil is the Dean, Postgraduate Studies at this University. His other associates are Dr. K.L. Jain, Dr. R.C. Sihag and Dr. J.P. Chaudhury.

The work of Dr. Kapil and his

## CALENDAR OF EVENTS

Proposed Dates of the Event	Title	Objective	Name of the Organising Department	Name of the Organising Secretary/Officer to be contacted
May 2-15, 1986	Summer School on Crystal Growth, Characterisation and Device Fabrication	An orientation course in (i) Experimental Crystal Growth; (ii) Theories of Crystal Growth; (iii) Nucleation; and (iv) Characterisation	Crystal Growth Centre, Anna University, Madras	Dr. P. Ramasamy, Crystal Growth Centre, Anna University, Madras
May 8-10, 1986	National Seminar on Interaction between research in Universities and Industries	To identify the industries where University research can play an important role and find out ways and means of active interaction between research in Universities and Industries	University of Delhi, Delhi	Dr. Yogesh Kumar, Department of Physics and Astrophysics, University of Delhi, Delhi
May 13-31, 1986	Orientation Programme on better utilization of irrigation resources	To acquaint the participants with the processes and problems relating to irrigation schemes, water management, rehabilitation, etc.	Centre for Social Studies, South Gujarat University, Surat in collaboration with Deptt. of Economics, M.S. University of Baroda	The Course Director, Centre for Social Studies, University Campus, Surat
May 19-24, 1986	Refresher course for practitioners in psychiatric social work	To acquaint the faculty members with advances in psychiatric social work	National Institute of Mental Health & Neuro-Sciences, Bangalore	The Director, NIMHANS, P.B. No. 2900, Bangalore
May 19-June 1, 1986	Summer School on Crystal Growth and Characterisation of Advanced Materials for Solid State Applications	An orientation course in (i) Experimental Crystal Growth; (ii) Theories of Crystal Growth; (iii) Nucleation; and (iv) Characterisation	Crystal Growth Centre, Anna University, Madras	Dr. P. Ramasamy, Crystal Growth Centre, Anna University, Madras

associates is concerned with the problems of honey-bees and solitary bees with a view to understanding their life processes as locked in the co-evolutionary mechanism of bee-flower relationship.

\* \* \*

Another scientist, Dr. Foren Singh Chaudhury has been given the second joint award for his Hindi publication, "Statistical Principles in Agriculture." His co-author, who has also been awarded the prize with Dr. Chaudhury is Dr. Daroga Singh. This book has been published by the Directorate of Publications of Haryana Agricultural University in 1983. Dr. Chaudhury is working as the Deputy Director (Statistics) in the Directorate of Research at this University.

\* \* \*

Dr. Balraj Singh, Associate Professor of Agronomy in Haryana Agricultural University has been selected for the Jawaharlal Nehru Award jointly with Dr. S.N. Pandey for the year 1983. Dr. Singh has been selected for this award in recognition for his research contribution in Agronomy.

Dr. Singh has contributed to better understanding of plant-water relations and the mechanism of drought resistance by comparing the performance of maize, sorghum and pearl millet with reference to internal water status and related plant processes under different irrigation levels. His studies serve as a base for screening germplasm and cultivars for increasing productivity under (a) limited water supply and (b) assured water supply.

### Biotechnology and tissue culture scheme

The Punjab Agricultural University has launched a new scheme of biotechnology and tissue culture. Under this scheme, new techniques of tissue culture would be used to disseminate the disease-free materials in horticulture and forestry.

## THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY : PATIALA

(AN INSTITUTION DEEMED TO BE A UNIVERSITY)

Advertisement No. TI/6/86

Applications are invited for the posts of Professors, Assistant Professors and Lecturers etc. as per details given below :

POSTS	SPECIALIZATION	NO. OF POSTS
<b>ELECTRICAL &amp; ELECTRONICS ENGINEERING DEPARTMENT</b>		
ASSISTANT PROFESSOR	Electronics/Instrumentation	One (Ex-cadre)
LECTURER	Computer Science	One (Permanent)
<b>MASTER OF COMPUTER APPLICATIONS COURSE (MCA)</b>		
PROFESSORS	Computer Science/Electronics Engineering/Electrical Engg. with experience in Computer System Operation and Management or Computer Applications in Business/Management Information Systems.	Two (Permanent)
ASSISTANT PROFESSORS	Computer Science/System Engg. with experience in Business/Management Information Systems.	Two (Permanent)
LECTURERS	Computer Science Management Sciences	One (Permanent) Two (Permanent)
<b>CIVIL ENGINEERING DEPARTMENT</b>		
LECTURERS	Structural Engineering Civil Engineering General	Three (Permanent) One (Permanent)
<b>MECHANICAL ENGINEERING DEPARTMENT</b>		
LECTURERS	Thermal Sciences/Mechanics and Machine Design/Hydraulic Machines/Production/Industrial	One (Permanent) One (Ex-Cadre) One (Temporary)
<b>APPLIED SCIENCES &amp; HUMANITIES DEPARTMENT</b>		
*LECTURER	Sociology	One (Ex-Cadre)
*LECTURER	Inorganic/Physical/Organic Chemistry	One (Ex-Cadre)
*Persons with Ph.D. degree and aptitude for research will be preferred and those having required experience and outstanding academic record may be appointed as Assistant Professor.		
<b>CENTRE OF ENERGY SCIENCES</b>		
RESEARCH ASSOCIATE	Qualifications : M.E./M.Tech. with five years experience or Ph.D. with one year experience.	One (Temporary)
PAY SCALE : Rs. 1100-50-1600 (U.G.C.)		
RESEARCH ENGINEERS	Mechanical Engineering (Thermal Science)	One (Ex-Cadre)
PAY SCALE : Rs. 700-40-1100-50-1300 (UGC)	Electrical & Electronics Engineering (Micro-Professor Applications.)	One (Ex-Cadre)
	Qualifications : First Class Bachelor of Engineering in Branch concerned. Candidates with Master's Degree in Engineering will be preferred.	

Pay scales, minimum qualifications and experience for the posts of Professors, Assistant Professors and Lecturers are as approved by the University Grants Commission. Candidates with first Class B.Tech degree may be considered for the posts of Lecturers, if suitable M.Tech./Ph.D. candidates are not available. Full details of minimum qualifications and experience for each post and application form may be obtained by writing to the Registrar.

Application on prescribed form giving full particulars including names and addresses of three referees and accompanied by Crossed Indian Postal Order for Rs. 5/- in favour of Registrar payable at Patiala should reach to the undersigned by 30th April, 1986.

REGISTRAR



# CENTRAL DRUG RESEARCH INSTITUTE

(Council of Scientific & Industrial Research)

## ADVERTISEMENT NO. 2/86

Applications are invited for the following posts in Central Drug Research Institute, Lucknow:

1. **SCIENTIST 'E-I'** : One Post  
(Rs. 1500-60-1800-100-2000)

Ist class M.Sc. (Botany) with 12 years research experience or Ph.D. in Botany with 10 years research experience in plant Taxonomy and experience in survey, collection, identification and documentation of plants in relation to their screening for biological activity as evidenced by published work.

**Job Requirement :** Planning and execution of programme of collection of plant samples in bulk from various phytogeographical regions of the country for the Institute project "Development of drugs from plant source". To supervise the maintenance of herbarium of the Institute.

2. **SCIENTIST 'C'** : Ten Posts  
(Rs. 1100-50-1600)

### Post Nos. (i & ii)

Ist class M.Sc. in Microbiology/Zoology with 6 years research experience/Ph.D. Microbiology/Zoology with 2 years research experience, as evidenced by publications in leading scientific journals in the area of Immunology/Immunodiagnosis/Seroepidemiology/Chemotherapy and Drug-resistance of Protozoan diseases like Malaria, Amoebiasis and Leishmaniasis.

### Job Requirement : Post No. (i)

To organize and conduct studies direct towards the development of serodiagnostic test and antigen detection methods for Tropical Parasitic diseases, carry out bulk production of parasite antigens for immunological studies and initiate studies on vaccination for diseases like malaria, Amoebiasis and Leishmaniasis.

### Post No. (ii)

To organize and conduct studies on the problems of chemotherapy and drug resistance in Malaria, and undertake studies on primates malaria for the development, screening and preclinical evaluation of new potential casual prophylactic and radical curative tissue schizontocidal drugs.

### Post No. (iii)

M.D./Ph.D. (Pathology/Medicine) with 2 years experience. Minimum experience is relaxable in exceptional cases.

### Job Requirement

- (1) To generate detailed haematological data in preclinical toxicity test on new compounds under Drug Regulatory requirements.
- (2) Should also be able to plan and conduct basic research with reference to haematological disorders/coagulopathies/immunohaematology and its application to toxicological problems.

### Post No. (iv)

Ist class M.Sc. with Zoology with 6 years experience or M.D. (Pathology/Ph.D. (Zoology) with 2 years experience in tissue pathology. Minimum experience is relaxable in exceptional cases.

### Job Requirement

To conduct and supervise regulatory toxicity studies of new compounds and to prepare histopathological evaluation report to carry out teratological and carcinogenic experiments.

**Post No. (v)**

A degree in Veterinary Science with first class post graduate degree in any branch of Veterinary Sciences MVSc (M.Sc.) 4 years experience in an Animal House/Hospital/Research Institute after postgraduation, experience in Animal House will be preferred.

**Job Requirement**

Management and supervision of laboratory animal colonies including non-human primates. Monitoring animal colonies for their health status, implementation of disease control programme and generation of biological data.

**Post No. (vi)**

1st class M.Sc. or 1st class B.E. in Chemical Engg. with six years experience or Ph.D. with two years experience in research in pharmaceutical or chemical industry or technology transfer to the pharmaceutical industry. The candidate should be able to compile and process information on the latest trends in the field of drugs and Pharmaceuticals.

**Job Requirement**

To liaise with the Pharmaceutical Industry and CSIR headquarters for transfer of technology for commercialisation; to undertake cost-benefit analysis of the technologies developed and negotiate collaboration and sponsorship from industry; to prepare feasibility reports and collaboration/sponsorship agreements, edit research reports and assist in filing of patents. To process international scientific cooperation/collaboration project proposals and to look after public relation work.

**Post No. (vii)**

First class M.Sc. with 6 years experience or Ph.D. with 2 years experience in synthetic chemistry, preferably in the synthesis of nucleosides and nucleotides.

**Job Requirement**

To synthesize nucleosides and nucleotides of biological interest.

**Post No. (viii)**

First class M.Sc. with 6 years experience or Ph.D. with 2 years experience in synthetic/natural products chemistry, preferably in the area of carbohydrate chemistry.

**Job Requirement**

To synthesize carbohydrates and contribute to the chemistry of carbohydrate.

**Post No. (ix)**

M.D. in Internal Medicine or a related discipline with 2 years experience of clinical pharmacological work, preferably designing, planning conducting clinical trials with new drugs, as evidenced by research publications.

**Job Requirement**

To undertake clinical drug trials and pharmacokinetic and pharmacodynamic studies with new drugs. The candidate would be required to plan and undertake these studies independently and to supervise the work of junior colleagues.

**Post No. (x)**

1st class M.Sc. (with specialisation in Immunology/Biochemistry/Parasitology/Microbiology) with 6 years experience or M.D. or Ph.D. with 2 years research experience in the speciality.

**Desirable :** Experience in hybridoma technology.

**Job Requirement**

To carry out immunological studies including immuno-modulation and immuno-prophylaxis in experimental malaria, leishmaniasis and filariasis.

**3. SCIENTIST 'B'**

(Rs. 700-40-900-EB-40-1100-50-1300)

Seven posts (3 posts reserved for SC & 1 for ST candidate).

**Post No. (i) (Unreserved)**

First class Master's degree in Natural Sciences/Statistics/Mathematics/Commerce/Operational Research. Experience in planning, monitoring and evaluation and budgeting and cost accounting of R&D projects in a biomedical research institution is desirable.

**Job Requirement**

Implementation of modern methods of R&D management; formulation, budgeting and cost accounting and coordination of R&D projects and preparation of plan documents; monitoring and evaluation of technical and financial performance of projects.

**Post No. (ii) (Reserved for ST candidate)**

Ist class M.Sc./Ph.D. in Biochemistry/Life Sciences. Research experience as evidenced by published papers desirable. The candidate must have working experience in membrane biochemistry/molecular immunology & should be conversant with latest immunological/biochemical techniques used in separation of biomolecules.

**Job Requirement**

To participate in the research programmes of the Institute in filariasis, intestinal helminthiasis, malaria or leishmaniasis, with special reference to enzyme characterization and lipid biochemistry.

**Post No. (iii) (Reserved for SC candidate)**

Ist class M.Sc./Ph.D. experience in natural products chemistry and biosynthesis desirable.

**Job Requirement**

To investigate natural products of plant or medicine origin.

**Post No. (iv) (Unreserved)**

Ist class M.Sc. or Ph.D. degree in organic chemistry. Experience in radiochemical synthesis, drug metabolism and pharmacokinetic studies desirable.

**Job Requirement**

Synthesis of radiolabelled compounds for metabolic and Pharmacokinetic studies. Isolation and characterisation of metabolites from biological fluids and tissues. Participate in computer assisted and simulated pharmacokinetic studies.

**Post No. (v) (Reserved for SC candidate)**

Ist class M.Sc. or Ph.D. degree in Zoology, Biochemistry or Microbiology. Experience in the development of radioimmuno and enzyme immunoassays and experience in hybridoma technology to raise monoclonal antibodies desirable.

**Job Requirement**

To study drug metabolism in **in Vivo** and **in Vitro** systems and development of immunoassay of new drugs.

\* **Post No. (vi) (Reserved for SC candidate)**

M.Sc. Ist class (Zoology with specialisation in parasitology/Microbiology) or M.B.B.S. or M.V.Sc. or relevant Ph.D degree. Research experience in Chemotherapy and immunology of experimental haemoprotozoal infections desirable.

**Job Requirement**

Maintenance of leishmanial infections **in Vitro** and **in Vivo** and chemotherapeutic studies including screening of potential antileishmanial compounds and their modes of action.

(\*) **Post No. (vii) (Unreserved)**

MBBS. Research experience in clinical trials as evidenced by publications is desirable.

**Job requirement :** To undertake Clinical and Experimental studies with new drugs.

4. **MEDICAL OFFICER (DISPENSARY) : On post (Unreserved)**

(Rs. 700-40-900-EB-40-1100-50-1300)

MBBS preferably with some clinical experience and postgraduate qualifications in some clinical speciality and good academic record.

5. **LADY MEDICAL OFFICER : One post (Unreserved)**

(Rs. 700-40-900-EB-40-1100-50-1300)

MBBS with some experience of work as gynaecologist. Preference will be given to candidate holding postgraduate qualification and with good academic record.

6. **SENIOR TECHNICAL ASSISTANT** : Two posts (1 post for SC & 1 post for ST)  
(Rs. 550-25-750-EB-30-900).

**Post No. (i)**

M.Sc. in biological sciences or B.Sc. (Biology) with 3 years experience in biochemical and experimental studies with new drugs.

**Job requirement** : To assist in clinical trials of new drugs.

**Post No. (ii)**

B.Sc. (Biology group) with atleast three years experience of work in a Pharmacology laboratory or M.Sc. (Zoology or Biochemistry) with experience of work in a pharmacology laboratory.

**Desirable** : Familiarity with the use of modern equipment and techniques used in pharmacological research.

7. **JUNIOR TECHNICAL ASSISTANT** : Ten posts (3 posts for SC & 2 posts for ST and 1 post for physically handicapped persons).

(Rs. 425-15-500-EB-15-560-20-700)

**Post No. (i) & (ii)** : (One post reserved for Physically Handicapped): B.Sc. (with Biology and Chemistry). Experience in Biomedical laboratory (Toxicology) desirable.

**Job requirement** : **Post No. (i)** : The candidate should be capable of assisting senior scientists in their routine and specialized projects in drug toxicology. **Post No. (ii)** : To assist the senior scientists in conducting toxicity and carcinogenicity testing using histochemical techniques.

**Post No. (iii) & (iv)** : (One post reserved for SC)

B.Sc. with Zoology as one of the subjects. Candidates having experience in Animal House or animal research programmes will be preferred.

**Job requirement** : To carry out breeding operations, experimental manipulations, maintenance of animal records, implementation of routines of feeding and cleaning operations, maintenance of animal rooms and laboratories.

**Post No. (v)** (Reserved for SC candidate)

B.Sc. with Chemistry, Botany. Experience in the field of applied microbiology in any research institute will be an added qualification.

**Job requirement**: Will help in fermentor operations different research projects. May have to work on shift duty.

**Post No. (vi)** (Reserved for ST)

B.Sc. with Physics, Chemistry and Mathematics. Knowledge of electronic/electrical equipment required for process control and knowledge of microprocessor, computer etc. will be additional advantage.

**Job requirement** : Will help in looking after instruments used in fermentation laboratory. May have to work on shift duty.

**Post No. (vii)** (Unreserved)

B.Sc. with Physics and Mathematics/Diploma (3 years) in Mechanical Engineering/Technology or equivalent. Experience in pipe fitting work, welding, operation of general workshops machines and experience in mechanical maintenance of Fermentation or Chemical plants etc. desirable.

**Job requirement** : To look after mechanical maintenance of fermentor and supporting equipment. May have to work on shift duty.

**Post No. (viii)** (Reserved for ST candidate)

B.Sc. with chemistry. Experience of working in a laboratory and experience of working in chemical process industry desirable.

**Job requirement** : To help in the scale up studies drugs and drug intermediates. Must be prepared to work in shifts.

**Post No. (ix) & (x)** (One post reserved for SC)

B.Sc. with Chemistry and Biology. Experience in synthetic organic chemistry and/or handling laboratory animals desirable.

**Job requirement** : Assist senior scientists in the synthesis of compounds to be used for metabolic and immunological studies and/or assist in work related to developing animal models for metabolic and related studies.



3. **NURSE** ; One post (reserved for SC candidate)

(Rs. 425-15-500-EB-15-560-20-700)

Diploma in General Nursing with some experience.

**GENERAL CONDITIONS**

1. All the above posts carry usual allowances as admissible under the rules of Govt. of India. Total emoluments at the minimum of the grades at present are as follows :

Basic pay	Emoluments
Rs. 1500/-	Rs. 3330.85
Rs. 1100/-	Rs. 2890.85
Rs. 700/-	Rs. 2088.05
Rs. 550/-	Rs. 1645.60
Rs. 425/-	Rs. 1402.80

**Medical Officer**

(i) Rs. 700/-	Rs. 2088.05
(ii) Non-practising allowance	: Rs. 150.00

Total : Rs. 2238.05

2. A lower standard of suitability in consistent with efficiency will be applied in respect of Scheduled Caste/Scheduled Tribe candidates for the reserved posts. Candidates belonging to these communities should invariably enclose an attested copy of the original caste certificate issued by a competent authority with their application failing which they will not be entitled to the concessions otherwise admissible to them. In the event of non-availability of SC/ST candidates for the post of Scientist B, the post will be filled up by general candidate by following the prescribed procedure.
3. Since it is not possible to call all the eligible candidates for interviews, the applicants will be shortlisted for the purpose and the decision of the Director will be final.
4. Applicants called for interview will be paid single second class rail fare to and fro the actual place of undertaking the journey or from the normal place of residence as mentioned in the application whichever is nearer to Lucknow Railway Station.
5. The prescribed application form may be obtained from the Administrative Officer, Central Drug Research Institute, Chattar Manzil Palace, P.B. No. 173, Lucknow 226 001 (U.P.) by sending a requisition duly indicating the post and advertisement No. alongwith a self-addressed stamped envelope (23 x 10 cms). Any request for application form received after 30.4.86 will not be entertained for supply by post. Application duly completed (supported by attested copies of certificates and testimonials) alongwith a non-refundable fee of Rs. 8/- (no application fee is prescribed for SC/ST candidates) in the form of crossed Indian Postal Order drawn in favour of the Director, Central Drug Research Institute, Chattar Manzil Palace, Lucknow-226001 should reach Director, CDRI, Lucknow on or before 15.5.1986. Applications received after this date will not be considered.
6. Separate application for each post alongwith requisite postal order in a separate envelope indicating the advertisement number and post applied for should be sent.
7. Candidates in Government/Semi-Govt. organisations, public undertakings and autonomous bodies should route their application through proper channel.
8. Physically handicapped candidates applying for the posts against categories 6,7 & 8 are exempted from payment of application and examination fee provided they are otherwise eligible for appointment to the posts on the basis of the standards of medical fitness prescribed for that post (including any concessions specifically extended to the physically handicapped) and who enclose with the application form, a necessary certificate from a Govt. hospital/Medical Board in support of his claim for being handicapped.
9. Canvassing in any form and/or bringing in any influence, political or otherwise, will be treated as a disqualification for the post.
10. Any of the particulars furnished by an applicant if found incorrect at any stage, his/her candidature is liable to be rejected and/or if already appointed, his/her service is liable to be terminated.
11. Interim inquiries will not be entertained.

# SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGINEERING

**SHEGAON 444 203**

Applications are invited on plain paper giving complete Bio-Data along with attested copies of certificates in support of statements made therein are invited for the following posts, in various departments for Engineering Degree courses affiliated to Amravati University.

S. No.	POST	DEPARTMENTS
1. <b>Professors</b> Present Scale Rs. 1500-2500+ Min. Total emoluments approx. Rs. 2913.25.		Electronics, Industrial Electronics, Electrical Power System, Mathematics
2. <b>Asstt. Professors</b> Present Scale Rs. 1200-1900 (Min. total emoluments approx. Rs. 2613.25)		Electronics, Industrial Electronics, Electrical Power Systems, Computer Engg., Mathematics and Instrumentation.
3. <b>Lecturers</b> Present Scale : Rs. 700-1600 (Min. total emoluments approx. Rs. 1743)		Electronics, Industrial Electronics, Instrumentation, Power System, Comp. Engg. Mathematics, Chemistry, Physics, Civil and Mechanical Engg.
4. <b>Computer Programmer</b> Present Scale : Rs. 500-960.		Computer Centre.
5. <b>Sports Director</b> Scale : 700-1200.		Sports & Games.
6. <b>Librarian</b> Scale : 700-1600		Library

Qualification, experience & other benefits as per U.G.C./AICTE, University & Govt. of Maharashtra rules.

Persons applying for higher posts with the following specifications will be preferred.

## **Electronics & Industrial Electronics**

Electronics, Power Electronics, Microprocessor & their Applications, Analog Digital Computers Bio-Medical Engg. Process Control, Semiconductor Devices, Medical Electronics.

## **Electrical Power System**

Electrical Power Systems, Electrical Machines, Instrumentation, Control Engg & High Voltage Engg.

## **Computer Engg**

Computer Hard-ware & Soft-ware.

Candidates who have secured Ist class B.E./B.Tech. or candidate appearing in final M.E./B.E. may also apply. Please send your application within **15 days from** the date of this advt. to the Principal of the College. Higher start will be given to the deserving candidates.

**V.Y. Mudliar**  
**SECRETARY**

**S.S. Patil**  
**PRESIDENT**

# AIU Library & Documentation Services

One of the important functions of the Association of Indian Universities is to act as a clearing house of information on higher education in the country. Towards this end the AIU Library is engaged in collection, building and developing instruments for the dissemination of research information. Over the years a valuable collection of books and documents on different aspects of higher education has been acquired.

The Library has also developed Bibliography of Doctoral Dissertations as an effective tool in the dissemination of research information. Retrospective bibliographies covering the period 1857-1970 and 1970-75 were the first to appear. Effective 1975, however, the bibliography is issued annually in two volumes. One volume deals with Natural and Applied Sciences while the other records doctoral degrees awarded in Social Sciences and the Humanities. In addition to the normal bibliographical details like the name of the Research Scholar, the title of the thesis, years of registration for and award of the degree, and the name of the University accepting the thesis for award of a doctoral degree, the bibliography also gives name and complete address of the supervising teacher and an availability note that seeks to inform whether a copy of the dissertation is available for consultation and use in the University Library/Department or Registrar's Office.

The columns 'Theses of the Month' and 'Research in Progress' are intended to cut out the time lag between the receipt of information and its inclusion in bibliography. Such Universities as are not sending us regular information in respect of Doctoral Theses accepted and research scholars enrolled are welcome to make use of these columns.

The Library is open from 9.30 a.m. to 5.30 p.m. Monday through Friday.

## RESEARCH IN PROGRESS

### A list of Research Scholars Registered for Doctoral Degrees of Indian Universities

#### PHYSICAL SCIENCES

##### Mathematics

1. Sebastian, Margaret. *Some applications of mathematical analysis*. BHU, Varanasi. Prof. S.N. Lal.
2. Singh, Vijay Prakash. *Multivariable  $H$  and  $J$ -functions, integral transforms and application*. BHU, Varanasi. Dr. Y.N. Prasad.

##### Physics

1. Bajaj, Kapil Mit Singh. *Low dimensional coulomb systems*. U Delhi. Dr. L.S. Kothari and Dr. Ravi Mehrotra.
2. Basak, Partho Sarthi. *Study for solar cells*. BHU, Varanasi. Dr. D.P. Singh.
3. Chadha, Rita. *Space and time dependent behaviour of fast neutrons in thorium uranium mixtures*. U Delhi. Dr. Feroz Ahmad.
4. Chakraborty, Rathindra Nath. *Studies on polymers*. BHU, Varanasi. Prof. A.K. Nigam.
5. Charanjev Kaur. *Multiparticle production at high energies*. U Delhi. Dr. D.P. Goyal.
6. Chaubey, Vinod Kumar. *Microwave and fibre optics communication*. BHU, Varanasi. Dr. K.K. Dey.
7. Chopra, Neena. *Glass ceramics*. U Delhi. Dr. G.K. Chadha.
8. Dabas, Poonam Rani. *Condensed matter physics : Dynamics of disordered systems*. U Delhi. Dr. S.P. Tewari.
9. Ghosh, Souvika. *Low PT phenomenon at high energy particle interactions*. U Delhi. Dr. D.P. Goyal.
10. Kohli, Geeta. *Semiconductor films*. U Delhi. Dr. Raj Rup.
11. Nair, Prabha B. *Studies on atmospheric aerosols*. U Ker, Trivandrum. Dr. B.V. Krishnamoorthy.
12. Pandey, Kripa Shanker. *Electronic structure and spectra of some biomolecules*. BHU, Varanasi. Dr. P.C. Mishra.
13. Pandey, Krishna Nath. *Energy transfer mechanism in molecular collision processes*. BHU, Varanasi. Dr. D.N. Tripathi.
14. Pandey, Suman Kumar. *Effect of random noise on quantum systems : Use of path integral methods*. U Delhi. Dr. Kamal K. Datta.
15. Radhika, V. *Atmospheric boundary layer*. U Ker, Trivandrum. Dr. B.V. Krishnamoorthy.

16. Rose, K.O. *Studies on atmospheric aerosols*. U Ker, Trivandrum. Dr. B.V. Krishnamoorthy.

17. Shiv Poojan. *Thin film studies of materials*. BHU, Varanasi. Prof. A.K. Nigam.

18. Singh, Umendra Narayan. *Study on non-linear properties of fibre optical wave-guides*. BHU, Varanasi. Dr. O.N. Singh and Dr. K.K. Dey.

##### Chemistry

1. Abolfath, Akbarzadeh. *Synthetic studies in heterocyclic compounds as potential antibacterial and antifungal agents*. U Delhi. Prof. V.K. Ahluwalia.

2. Bandiwadekar, Subhash Pandurang. *The potentiometric studies of substituted carboxylic and hydroxy acids and their metal complexes*. Shivaji U, Kolhapur. Dr. A.M. Chavan.

3. Bhojani, Yusufali Nazarali. *Kinetics and mechanism of oxidation of some hydroxy acids by chloramine-T*. Shivaji U, Kolhapur.

4. Gupta, Sandhya. *Chemistry of natural products and synthesis of antibiotic compounds*. U Delhi. Dr. V.S. Parmar.

5. Gwala, Ramayan. *Dynamic instability in reacting systems*. BHU, Varanasi. Prof. R.P. Rastogi.

6. Kaw Chetna. *Complexes of some tetravalent metal ions in the sulphur-nitrogen ligands*. BHU, Varanasi. Dr. N.K. Singh.

7. Kirti, Chandra. *Studies on some sulphur compounds*. BHU, Varanasi. Prof. P.K. Srivastava.

8. Mandal, Kam Deo. *Preparation and characterisation of organic semiconductor for solar energy conversion*. BHU, Varanasi. Dr. U.S. Raj.

9. Mane, Shamarao Vithoba. *Column chromatographic separation and kinetic studies of some metal ions on Dowex 21 K(C) in mixed media*. Shivaji U, Kolhapur. Dr. S.V. Kulkarni.

10. Prasad, Chandra Shekhar. *Investigation of metal ligands equilibria of trace metal with some biologically important ligands*. BHU, Varanasi. Dr. A.K. Ghosh.

11. Tiwari, Shashi Kant. *Deposition of hydrogen peroxide by absorbed metal*. BHU, Varanasi. Dr. R.N. Singh.

12. Yadav, Shiv Kumar. *Photochemistry of quononoid compounds*. U Delhi. Dr. R.M. Khanna.

#### Earth Sciences

1. Ajay Kumar. *Primary and secondary dispersion studies around Bulda Tungston deposit Sirohi District, Rajasthan, India*. HS Gour, Sagar. Dr. J.P. Shrivastava.

2. Ghagat, Jayant Bhai. *Hydrogeological investigations in the Bila Command Area, Madhya Pradesh*. HS Gour, Sagar. Prof. Bhagwan Das.

3. Laybidi, Jahandar Izadi. *Effect of mineralogical constitution on the properties of iron ore pellets*. BHU, Varanasi. Prof. A.K. Bhattacharya and Prof. Brahm Prakash.

4. Prasanna Kumar, V. *Structure of the Southern part of Chitradurga Schist belt around Chiknayakanahalli, Tumkur District, Karnataka, India*. U Ker, Trivandrum.

5. Ravi, Chaurasia. *Hydrogeology of the upper reaches of the Bhandar Command Area, Madhya Pradesh*. HS Gour, Sagar. Prof. Bhagwan Das.

6. Shinde, Sanjay V. *Hydrogeological investigations of the Berasia Block, Sehore District, M.P.* HS Gour, Sagar. Prof. Bhagwan Das.

#### Engineering & Technology

1. Chaudhary, Shailendra. *Hydrogeology of the Berwa Canal Command Area, Uttar Pradesh, India*. HS Gour, Sagar. Dr. L.P. Chaurasia.

2. Sharma, Sudhir Kumar. *Microwave interaction with material media*. BHU, Varanasi. Dr. K.P. Singh.

3. Usha, K. *Development of optional bus route network for a city*. U Ker, Trivandrum. Dr. N. Ramchandra Rao and Dr. P.S. Mony.

#### Anthropology

1. Vidyarthi, Pankaj Kumar. *Response to change, study of pat area in South Bihar*. U Delhi. Dr. J.S. Bhandari.

#### Botany

1. Ashok Kumar. *N<sub>2</sub> fixation by paddy soil algae*. BHU, Varanasi. Dr. D.N. Tewari.

2. Chaudhry, Rajesh Kumar. *Air pollution in relation to microbial ecology*. U Delhi. Prof. K.G. Mukerji.

3. Holkar, Nyayaswaroop Yashwant. *Molecular biology of plant growth*. U Delhi. Prof. S.C. Maheshwari.

4. Rai, Sanjay. *Physiology and biochemistry of blue-green algae*. BHU, Varanasi. Dr. A.K. Rai.

5. Sahoo, Dinabandhu. *Developmental, histochemical and ultrastructural studies on Cystoseira from Indian Coasts*. U Delhi. Dr. M.R. Vijay Raghavan.

6. Seth, Neeru. *Histochemical and ultrastructural studies in forage legumes*. U Delhi. Dr. M.R. Vijayaraghavan.

#### Zoology

1. Gupta, Kamal Kumar. *Insect reproduction*. U Delhi. Dr. S.S. Sehgal.

2. Jaiswal, Kumkum. *Mammalian reproductive physiology*. BHU, Varanasi. Dr. A. Krishna.

3. Jena, Amulya Ratan. *Chromosome replication patterns in some Indian birds*. Sambalpur U. Dr. Ranjit Kumar Das.

4. Mehta, Anuradha. *Carcinogenesis in chick : Effect of zinc supplementation in the diet*. U Delhi. Dr. K.V. Rao and Prof. P.C. Beohar.

5. Mohanty, Ashis Kumar. *Nutrition, hormones and reproduction in mammal*. U Delhi. Dr. P.K. Paul.

6. Raghavindra, Kmaraju. *Genetic and biochemical aspects of insecticide resistance in Anophelines*. U Delhi. Prof. M.K.K. Pillai and Dr. (Mrs.) S.K. Subbarao.

7. Rana, Satinder Singh. *Reproduction in insects*. U Delhi. Prof. S.S. Sehgal.

8. Sanas, Kavita Prataprao. *Neurosecretory control over the reproduction of Semperula maculata*. Shivaji U, Kolhapur. Dr. S.G. Nanaware.

9. Sreekumar, S. *A comparative study of regulation of digestive enzymes in Opisina arenosella (Lepidoptera) and Oryctes rhinorvus (Coleoptera)*. U Kera, Trivandrum. Dr. V.K.K. Prabhoo.

10. Walia, Renu. *Histophysiological studies on skeletal muscles*. U Delhi. Dr. C.L. Talesara.

#### Medical Sciences

1. Agrawal, Deepa. *Evaluation of origin and nature of mind*. BHU, Varanasi. Prof. I.M. Singh and Prof. G.B. Dubey.

2. Agrawal, Urmila. *Psychosocial risk factors in coronary heart disease*. BHU, Varanasi. Prof. G.B. Dubey.

3. Daroga Singh. *A study on plant pesticides*. BHU, Varanasi. Dr. H.N. Singh and Prof. R.H. Singh.

4. Guru, Ashok Kumar. *Studies on lipid profiles in relation to psychosomatic constitutions*. BHU, Varanasi. Dr. J.P.N. Chansuriya and Prof. G.P. Dubey.

5. Jai Prakash. *Psychological evaluation of ayurvedic and yoga therapy in promotion of health*. BHU, Varanasi. Dr. K.P. Shukla.

6. Pillai, M. Radhakrishna. *Effect of radiotherapy on immune response in cancer patients*. U Ker, Trivandrum. Dr. B. Prabha and Dr. M. Krishnan Nair.

7. Radhakrishna Pillai, M. *Effect of radiotherapy on immune response in cancer patients*. U Ker, Trivandrum. Dr. B. Prabha and Dr. M. Krishnan Nair.

8. Surendra Kumar. *Chemical investigation of immunoregulant principles of some plant drugs*. BHU, Varanasi. Prof. S. Ghoshal.

9. Yadav, Bijay Bahadur. *Neurosis in patients of chronic disorders*. BHU, Varanasi. Dr. K.P. Shukla.

## THESES OF THE MONTH

### A list of Doctoral Theses Accepted by Indian Universities

#### PHYSICAL SCIENCES

##### Mathematics

1. Akhtar, Syed Sohail. *A study on some linear topological spaces*. Mag U, Bodh Gaya.

2. Bhakta, Jagadishchandra. *On some problems of plasma instabilities*. U Calcutta.

3. Gupta, Arvind Kumar. *Some optimization techniques in mathematical programming*. Meerut U.

4. Jamwal, Dalip Singh. *Countably finite spaces and excisive couples*. U Jammu.

5. Kuldeep Narain. *Studies of integral equations and series with their applications in thermal elasticity*. RDV, Jabalpur.

6. Lakshmanan, L. *Certain studies in the structure of an algebraic semigroup*. U Bangalore.

7. Roy, Bhaswati. *Certain flow and heat transfer problems of non-Newtonian fluids*. Dibrugarh U.

8. Sarada, S. *Stiffened plates : A mathematical approach*. U Madras.

9. Sharma, Sri Kant. *A study of locally convex tensor products and nuclear spaces*. Mag U, Bodh Gaya.

10. Thiagarajan, M. *Stochastic analysis of some problems in social and biological sciences*. U Madras.

11. Thimmarayappa, H.M. *Diffusion and allied problems in continuum mechanics*. Gulbarga U.

##### Statistics

1. Hara Gopal, V.V. *Some problems on discrimination and classification*. OU, Hyderabad.

##### Physics

1. Abdul Khader, Mohanmad. *Ultrasonic investigation on slow and fast muscle tissues*. OU, Hyderabad.

2. Barham Pal. *Electric field gradients in cubic dilute alloys*. Pt U, 3 Chandigarh.

3. Chatterjee, Saurindra Mohan. *Studies in alpha-decay widths of some translead and sub-lead nuclei and their systematics*. ISM, Dhanbad.

4. Chowdary, L.V. *Phase transition studies on certain thermotropic liquid crystals*. Nagarjuna U.

5. Deshmukh, Lalasaheb Patangarao. *Studies on photoelectrode dependent properties of electrochemical photovoltaic cells*. Shivaji U, Kolhapur.

6. Lakshmi Narayan, N. *Tellurium oxide thin films-formation and study*. U Madras.

7. Maitra, Animesh. *Some satellite beacon studies of the ionospheric irregularities near the crest of the equatorial anomaly in the Indian longitude zone*. U Calcutta.

8. Major, Syed Salahuddin. *Transparent conducting zinc oxide films by spray pyrolysis*. IIT, Delhi.



9. Malathi, R. *The heminucleotide concept and its implications in conformation analysis of nucleic acids.* U Madras.
10. Mishra, Prasanna Kumar. *Studies on the propagation characteristics of single mode optical waveguides.* IIT, Delhi.
11. Nagarkar, Vivek Vinayak. *Design and development of a system to study two dimensional angular correction of positions using high density multiwire proportional chambers.* U Poona.
12. Natarajan, R.K. *Angular correlation and missing energy spectrum in quasifree electron scattering.* U Madras.
13. Pathak, Pratibha. *Studies in electrical conductivity and energy transfer characteristics of some organic compounds: Polymeric films.* HS Gour, Sagar.
14. Pati, Shankar Prasad. *Computer studies on the properties of millimeter wave impatt diodes.* U Calcutta.
15. Rai, Jagdish. *Optical resonances in multilevel atoms.* IIT, Delhi.
16. Rai, Suranjana. *Theory and photon statistics of a free electron laser.* IIT, Delhi.
17. Ramanujam, R. *Studies on vacuum evaporated erbium fluoride and dysprosium fluoride thin films.* U Madras.
18. Ravichandran, V. *Studies in structural crystallography.* U Madras.
19. Samnao, Phatisena. *Many-body aspects of 2 dimensional and quasi-2 dimensional electron gas at finite temperatures.* U Poona.
20. Sengupta, Manan. *Studies on asymptotic behaviour of perturbative non-abelian gauge theory.* U Calcutta.
21. Sessa Kumari, Ch. *Analytical investigation of system design in Mossbauer spectroscopy.* OU, Hyderabad.
22. Vashi, Maheshkumar Nathubhai. *Growth and characterization of tungsten selenide single crystals with their use in photo-electrochemical solar cells.* SPU, Vallabh Vidyanagar.
23. Velmurugan, D. *Some statistical applications and structural studies in crystallography.* U Madras.

#### Chemistry

1. Anbazhagan, K. *Studies on polyurethanes crosslinked with graft copolymer.* U Madras.
2. Andipara, Ramnik Kanjibhai. *Studies on metal complexes.* Bhavnagar U.
3. Ansari, Abdul Hafiz. *Studies on active constituents of some Indian medicinal plants.* HS Gour, Sagar.
4. Arora, Chandra Prakash. *Anticouplastin agents : Synthesis and characterisation of some substituted thiocarbonyl pyrazoles and their derivatives.* Meerut U.
5. Balasubramanian, S. *Metal complexes of macrocyclic and non cyclic ligands : Synthesis and characterization.* U Madras.
6. Bhat, Rajiv. *Thermodynamic studies of aqueous solutions of some biopolymer model compounds.* IIT, Delhi.
7. Bhattacharjee, Bharati. *Studies on some aspects of molecular complexes.* NEHU, Shillong.
8. Bhosale, Popatrao Nivrutti. *Studies on growth of V-VI compounds by solution-gas interface technique and their use in ECPV cells.* Shivaji U, Kolhapur.
9. Das, Sarmistha. *Mechanistic studies on the electrophile catalysed dissociation reactions of some complexes of cobalt (III) and chromium (III).* U Calcutta.
10. Goel, Dhirajlal Devrajibhai. *Preparation of microbiologically active compounds.* Bhavnagar U.
11. Goudgaon, Naganna M. *Studies in phytochemistry.* U Poona.
12. Gupta, Naresh Chand. *Synthesis and structural studies of some heavy metal ions complexes with nitrogen, oxygen and sulphur donor ligands.* Meerut U.
13. Gupta, Rajesh Kumar. *Chemical study of plant saponins occurring in leguminosae and Solanaceae families.* Avadh U.
14. Gupta, Subhash. *Studies on the chemical and nutritional changes during storage of pulses by *Callosobruchus maculatus* Linn insect and its control.* Meerut U.
15. Harilatha Reddy, M. *Interaction of metal ions with nucleosides in solution.* OU, Hyderabad.
16. Harsh. *Optical studies in solids and solutions.* IIT, Delhi.
17. Jagannadha Rao, Vemuru. *Some new analytical aspects of cavotheline.* Andhra U, Waltair.
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43. Singh, Dipti. *Studies on complexes of transition metal ions and some ex-cations with some substituted dithiurens.* RDV, Jabalpur.
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51. Venkateshwarlu, G. *Conformational studies of some  $\alpha, \beta$  unsaturated carbonyl compounds by infrared spectroscopy.* OU, Hyderabad.
52. Vidya Sagar, Vuligonda. *Synthesis of some biologically active compounds.* U Poona.
53. Xavierkutty, M.C. *Experiments on the synthesis of structures containing hetero-atoms.* Pb Agil, Ludhiana.

## Earth Sciences

1. Grewal, Harjinder Singh. *Sedimentology of the jaunsar group exposed in the Kandiaghat-Nagaon-Rehad region, Simla Hills, North Western Himalayas*. Pb U, Chandigarh.
2. Harpale, Vinayak M. *A study of laboratory and atmospheric aerosols*. U Poona.
3. Jodhawat, Roshan Lal. *A study of Bwalvia from the Jurassic Beds of Jaisalmer, Rajasthan*. U Raj, Jaipur.
4. Josyulu, B.S. *Geophysical prospecting of chromite near Ligannapeta, Khammam Distt. A.P. and related studies towards optimization*. OU, Hyderabad.
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9. Ramasamy, Somasundaram. *Kinematic model for the evolution of Ramgarh Dome, Vindhyan Basin, Rajasthan : A study aided by remote sensing*. Andhra U.
10. Venkat Reddy, D. *Groundwater studies of the coastal aquifers of Pondicherry and its environs*. OU, Hyderabad.

## Engineering & Technology

1. Aggarwal, Darshan Kumar. *Optimum design of jet pump systems for irrigation*. Pb U, Chandigarh.

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Under the bilateral Cultural Exchange Programme between the Government of India and the People's Republic of China, the following scholarships are offered by Chinese Government to Indian scholars for study of language and other subject fields as per details given below :

1. Five scholarships for study of Chinese language.
2. Four Scholarships for study of subjects like Chinese History, Political Economics and Philosophy.

The eligibility conditions of the applicants for these scholarships are given below :

**Age :** Not exceeding 30 years as on 1.7.1986. **Qualifications for language scholarships:** 2-3 years grounding in basic Chinese language i.e. either a certificate or diploma from reputed/recognised institute. **Qualifications for specialised subject fields :** A graduate in the Chinese language from JNU or a comparable level from any other recognised University in India or abroad. **Amount of scholarship, etc.:** The cost of air passage both ways as well as the expenditure on boarding and lodging and out of pocket expenses will be borne by the Chinese Government. **General :** The selected scholars for language study would be initially sent to Peking Language Institute, where their level will be assessed for placement in the appropriate course. In case suitable number of candidates for subject fields like Chinese History, Political Economics and Philosophy are not available the scholars will be granted language study.

The last date for receipt of the application forms duly completed in all respects is **30-4-1986**. The application forms can be obtained by sending a self-addressed stamped envelope from Ministry of Human Resource Development, Department of Education, Language Division, Room No. 307 'C' Wing, Shastri Bhawan, New Delhi.

**Duration of Course :-** 1-2 years

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**UNIVERSITY OF BOMBAY**  
**DEPARTMENT OF CHEMICAL TECHNOLOGY**  
**MATUNGA, BOMBAY 400 019**

Applications are invited in the prescribed form for the following posts in the University Department of Chemical Technology :

Sr. No.	Designation of the Post	No. of Posts	Post reserved for (SC/ST/DT and NT)	Open Category
1.	Professor of Fermentation Technology	1	—	1
2.	Professor of Chemical Engineering	1	—	1
+ 3.	Reader in Chemical Engineering	*2 +	—	2
+ 4.	Reader in Fibre Science	1 +	—	1
+ 5.	Reader in Technology of Dyeing and Printing	1 +	—	1
+ 6.	Sir Dorabji Tata Reader in Pharmaceutical Chemistry	1 +	—	1
7.	Sir Homi Mehta Reader in Technology of Oils, Fats and Waxes	1	—	1
8.	Lecturer in Chemical Engineering	3	1	2
9.	Singhanee Lecturer in Chemical Engineering	1	1	—
10.	Lecturer in Polymer Technology	1	1	—
11.	Lecturer in Applied Biochemistry	1	1	—
12.	Lecturer in Pharmacognosy	1	1	—
13.	Lecturer in General Engineering	2	2	—
14.	Lecturer in Oils, Fats and Waxes	1	—	1
15.	Lecturer in Food Technology	1	1	—
+ 16.	Lecturer in Pharmaceutics	+ 1	—	1
+ 17.	Lecturer in Technology of Paints and Varnishes	+ 1	—	1
+ 18.	Lecturer in Tinctorial Chemistry	+ 1	—	1
19.	Professor of Applied Mathematics	1	—	1
20.	Reader in Applied Mathematics	1	—	1
+ 21.	Reader in Physics	+ 2	—	2
22.	Reader in Chemistry (Physical)	1	—	1
23.	Lecturer in Micro-Analysis	1	1	—
24.	Lecturer in Physics	1	1	—
25.	Lecturer in Chemistry (Organic)	1	—	1

\*(One of the post is 'Singhanee Reader in Chemical Engineering')

The pay-scales of the posts are as follows :

Professor—Rs. 1500-60-1800-100-2000-125/2-2500

Reader—Rs. 1200-50-1300-60-1900

Lecturer—Rs. 700-40-1100-50-1600

In addition to pay, Dearness Allowance, House Rent Allowance and Compensatory Local Allowance will be paid according to the University rules. The total emoluments at the minimum of the respective pay-scales at the current rates of allowances are as follows :

Professor—Rs. 3095.35

Reader—Rs. 2795.35

Lecturer—Rs. 1900.00

A higher starting pay may be given to persons appointed to the posts of Professor and Reader in special cases. All posts carry the retirement benefits according to the existing rules of the University. Teachers of the University are permitted to take up outside work according to the University rules. The appointments to the post will be made on probation for two years but the probationary period may be reduced by the Executive Council in special cases. Candidates belonging to the Scheduled Castes, Scheduled Tribes, Denotified Tribes and Nomadic Tribes so notified for the State of Maharashtra/ Union Territory of Goa, Daman and Diu, will alone be considered for the reserved posts at the respective places. If suitable

candidates from the Backward Classes are not available, other candidates will be considered for appointment on purely temporary basis except for the posts at serial numbers 9, 11 and 24.

The minimum qualifications prescribed for the posts at serial numbers 1 to 18 are as under :

**Professor**

An eminent scholar with published work of high quality, actively engaged in research. Ten year's experience of teaching and/or research. Experience of guiding research at doctoral level.

Or

An outstanding Engineer/Technologist with established reputation who has made significant contribution to knowledge.

**Reader**

Good academic record with a Doctor's degree in a relevant field. About five year's experience of teaching and/or research and development.

Provided further that candidates not possessing a Doctor's degree may be considered if they have to their credit equivalent research published work or design/development work of a high order either in the institution or in an industry.

Or

In the case of persons to be recruited from industry or professional field, candidates should possess good academic record with recognised professional work of about

seven years which should include innovation and/or research and development.

**Lecturer**

(a) Master's degree in appropriate field in Engineering/Technology; (b) Consistently good academic record with a Bachelor's degree in Engineering/Technology. First class at Bachelor's degree and/or Master's degree level; (c) One year's relevant professional experience outside academic/research institutions.

Having regard to the requirements of emerging fields of Engineering and of developing interdisciplinary programmes, the requirements of Engineering/Technology degrees may be waived in the cases of otherwise well qualified candidates.

Provided further that if a candidate does not possess professional experience or a person possessing such experience is not found suitable, the person appointed will be required to obtain desired professional experience within a period of five years of his appointment, failing which, he will not be able to earn future increments until he fulfils this requirement.

The minimum qualifications prescribed for the posts at serial numbers 19 to 25 are as under :

**Professor**

An eminent scholar with published work of high quality actively engaged in research. About ten year's experience of teaching and/or research. Experience of guiding research at doctoral level.

Or

An outstanding scholar with established reputation who has made significant contribution to knowledge.

**Reader**

Good academic record with a doctoral degree or equivalent published work. Evidence of being actively engaged in (i) research or (ii) innovation in teaching methods or (iii) production of teaching materials.

About five year's experience of teaching and/or research provided that at least three of these years were as Lecturer or in an equivalent position. This condition may be relaxed in the case of candidates with outstanding record of teaching research.

**Lecturer**

(a) A Doctor's degree or research work of an equally high standard; and

(b) Good academic record with at least second class (C in the seven-point scale) Master's degree in a relevant subject from an Indian University or an equivalent degree from a foreign university.

Having regard to the need for developing interdisciplinary programmes, the degrees in (a) and (b) above may be in relevant subjects.

Provided that if the selection committee is of the view that the research work of a candidate as evident either from his thesis or from his published work is of very high standard, it may relax any of the qualifications prescribed in (b) above.

Provided further that if a candidate possessing a Doctor's degree or equivalent research work is not available or is not considered suitable, candidate possessing a good academic record, (weightage being



given to M. Phil. or equivalent degree or research work of quality) may be appointed provided he has done research work for at least two years or has practical experience in a research laboratory/organisation on the condition that he will have to obtain a Doctor's degree or give evidence of research of high standard within eight years of his appointment, failing which he will not be able to earn future increments until he fulfils these requirements.

The additional qualifications prescribed for the posts are as under :

**1. Professor of Fermentation Technology**

Degree in first class in Chemical Technology/Biochemical Engg./Chemical Engg./Microbiology and Doctorate in the respective field with extensive teaching and research experience in Fermentation Technology/Industrial Microbiology/Biochemical Engg. Experience of guiding Ph.D. research in any of these areas. Publications in Journals of standing.

**2. Professor of Chemical Engineering**

Specialisation in the field of Chemical Reaction Engineering, multiphase reactions/reactors, optimisation and process control. Consulting experience, with a proven track record will be given due importance.

**3. Reader in Chemical Engineering**

Specialisation in area of Mass Transfer/Chemical Reaction Engineering/Process Dynamics and Control. Publications in Journals of standing. Consulting experience with industry highly desirable.

**4. Reader in Fibre Science**

Research experience is essential in Fibre Chemistry, Fibre Physics, Physico-chemical aspects of Chemical Processing and/or new techniques in the study of fibre structure and properties.

Experience in guiding research for Doctorate degree is desirable.

**5. Reader in Technology of Dyeing and Printing**

Research experience is essential in improving methods of dyeing, printing and/or finishing, physicochemical aspects of chemical processing, relation of fibre chemistry and structure to colouration and finishing. Experience in guiding research for Doctorate degree is desirable.

**6. Sir Dnrabji Tata Reader in Pharmaceutical Chemistry**

Basic qualification in Pharmaceutical Science viz. B.Pharm., M.Pharm. or B.Sc. (Tech.) (Pharmaceuticals and Fine Chemicals) and a Doctorate degree in Pharmaceutical Technology. Experience of teaching and guiding research in pharmaceutical chemistry and/or analysis of drugs and published original work in journals of repute.

**7. Sir Homi Mehta Reader in Technology of Oils, Fats and Waxes**

(i) A doctorate degree in Technology of Oils, Fats and Waxes or a doctorate degree in Organic or Biochemistry with research work in the areas of Oilseeds, Oils and Fats.

(ii) Weightage will be given to those having experience of guiding research workers or students.

**8. Lecturer in Chemical Engineering**

Experience in computer aided design is highly desirable.

**9. Singhanee Lecturer in Chemical Engineering**

Experience in computer aided design is highly desirable.

**11. Lecturer in Applied Biochemistry**

Master's degree in Food Technology or Ph.D. in Biochemistry with experience of research and teaching nutritional biochemistry/microbial metabolism/drug action and metabolism.

**12. Lecturer in Pharmacognosy**

Graduate and Master's degree in Pharmacy. The latter with specialisation in Pharmacognosy.

Desirable : Ph.D. in Pharmacy/Pharm. Technology and aptitude for research in natural products.

**13. Lecturer in General Engineering**

Master's degree in Mechanical/Electrical/Electronic Engineering. Experience in Workshop and Laboratory activities/maintenance areas will be preferred.

**14. Lecturer in Oils, Fats and Waxes**

Master's degree in Oil/Food Technology with one year's industrial/research experience in the area of oilseeds, oils and fats or Ph.D. in Biochemistry/Organic Chemistry who has worked on a problem related to oilseeds, oils and fats.

**15. Lecturer in Food Technology**

Master's degree in Food Technology in first class with experience of teaching and/or research.

**16. Lecturer in Pharmaceutics**

M.Pharm. in Pharmaceutics or M.Sc. (Tech.) in Pharmaceuticals and Fine Chemicals with specialisation in Pharmaceutics.

**19. Professor of Applied Mathematics**

Doctorate in Applied Mathematics with specialisation in Elasticity/Plasticity/Wave propagation/Fluid Mechanics. Teaching experience of about 15 years to students of engineering technology.

In addition to research work and guiding Ph.D. students in one of the above fields, ability to assist in research in Chemical Engineering and Chemical Technologies in matters of Applied Mathematics, application of statistical methods, statistical quality control, numerical analysis of technical and experimental data

**20. Reader in Applied Mathematics**

Doctorate in Applied Mathematics with specialisation in Magnetohydrodynamics/Fluid Mechanics. Over 10 year's experience of teaching mathematics to students of Engineering/technology and of research in field of specialisation with publications in the Journals of repute. Experience of guiding research at doctorate level will be considered an additional qualification.

**21. Reader in Physics**

At least 10 year's teaching and research experience. Research experience of high calibre as evidenced by published papers and guiding students for research degrees will be considered essential. Specialisation in one or more of the following areas will be preferred :

1. Spectroscopy of polyatomic molecules.
2. Polymer Physics

**3. Colour Measurement**

**4. Laser/Laser Spectroscopy**

**22. Reader in Chemistry (Physical)**

Specialisation in Surface Chemistry Ion Exchange, Electro-chemistry or Chemical Kinetics. Ability to handle sophisticated analytical instruments.

**23. Lecturer in Microanalysis**

Master's degree in Analytical Chemistry/Organic Chemistry/Chemical Technology with considerable experience of micro-analytical work.

**24. Lecturer in Physics**

Specialisation in experimental solid state physics/molecular physics/laser physics/optical spectroscopy of complex organic molecules/Organic photo-conductors. Experience in experimental laser physics, especially dye lasers of study or fast reaction and luminescence is desirable.

**25. Lecturer in Chemistry (Organic)**

Experience of conducting practical classes in Organic Chemistry preferred. Ph.D. in Organic Chemistry desirable

The qualification regarding experience is relaxable at the discretion of the Executive Council on the recommendation of the Selection Committee in the case of candidates belonging to the Scheduled Castes, Scheduled Tribes, Denotified Tribes, and Nomadic Tribes.

Eight copies of the Application in the prescribed form, together with copies of certificates and the prescribed fee, should be sent in an envelope superscribed with "Application for the post of \_\_\_\_\_" so as to reach the Director, Department of Chemical Technology, Matunga, Bombay-400 019, on or before Wednesday, the 7th May, 1986. Candidates from abroad, Andaman and Nicobar Islands and Lakshadweep may send their applications so as to reach the Director on or before Wednesday, the 14th May, 1986. Candidates who are already employed shall send their applications through proper channel. The University reserves the right of accepting/rejecting application received after the last date fixed for the receipt of applications. Applications on plain paper will not be considered. Canvassing, direct or indirect, will be a disqualification.

A set of prescribed forms of eight application can be had at the counter of the Department on payment of Rs. 40/- in cash.

Requests for supply of a set of eight prescribed forms by post should be made sufficiently in advance with a self-addressed stamped (Rs. 2.10) envelope of the size of 27 x 12 cms. and Crossed Indian Postal Order or a Crossed Demand Draft on Scheduled Bank for Rs. 40/- drawn in favour of 'the Director, U.D.C.T., Matunga, Bombay-19 payable at Bombay.'

Note : +÷ These posts are permanent. However appointments are to be made on temporary basis and likely to be made permanent.

**D. V. Rege**  
**DIRECTOR**

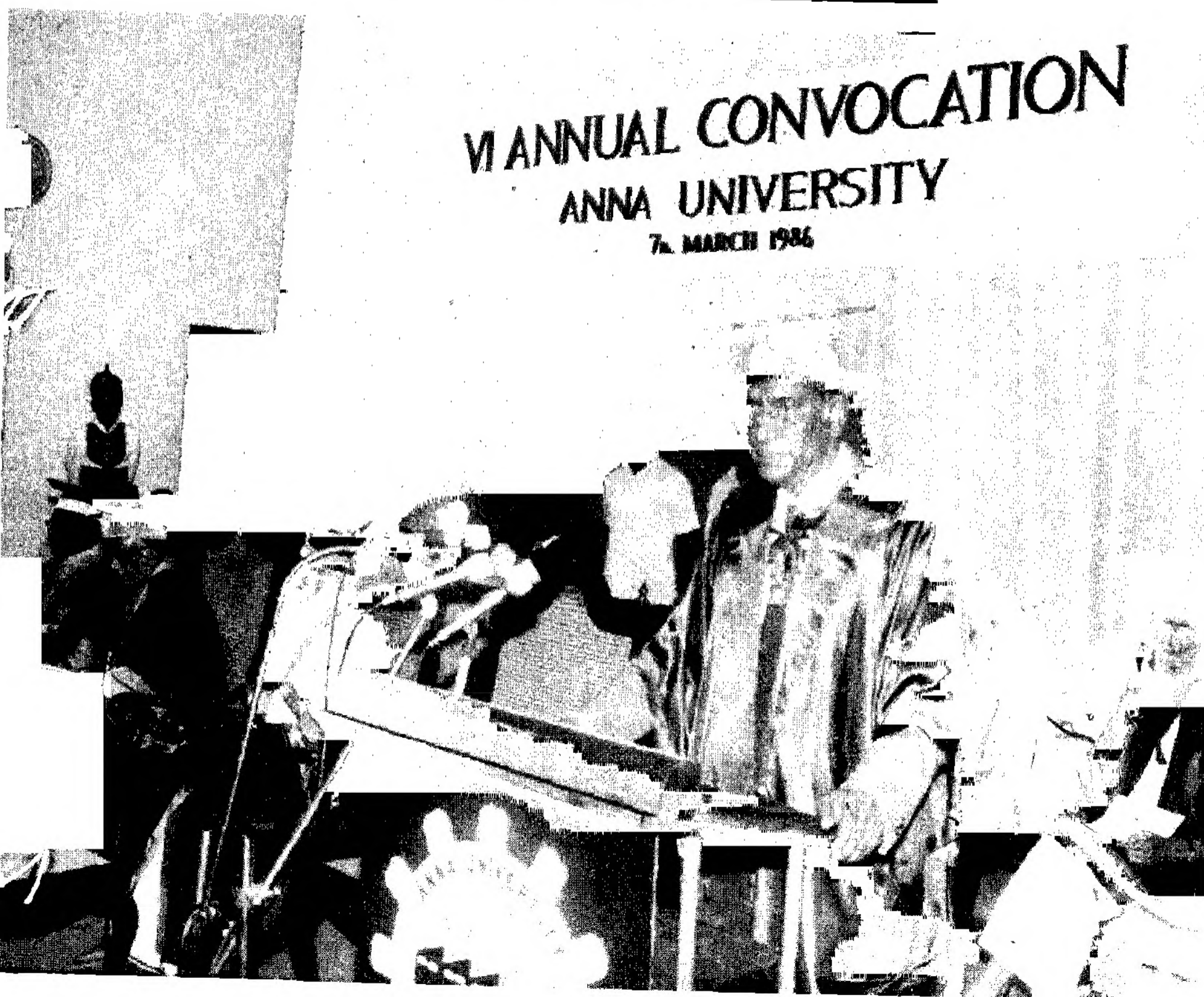


# University News

APRIL 23, 1986

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**Editor :**  
**SUTINDER SINGH**

# Education and India in 21st Century

**Biman Sen\***

## Learning Process — structure and contents

If we critically analyse the evolution of learning system, it would be clear that its structure and contents are determined by the requirements of higher education which are closely linked with the objectives and purposes as determined by the ruling elites. But the situation has now changed. It is people's aspirations that should determine the contents and structure of education and training system and not the dictates of a few individuals.

Science and technology has also created a unique situation, in which, human beings can achieve the ultimate goal of a utopian world free from all drudgeries and tensions. This will create conditions for more and more leisure. It is, therefore, expected that 21st century will also be an age of creativity. Education and training for creativity and leisure should be an important component of the new learning system.

Since science and technology are universal, types, quality or competence of man-power requirement for development of science and technology, their application and management for economic or industrial development of a country cannot be different from any other. Therefore, logically the basic structure or contents of education should not be different from country to country. The character of education has to be universal. Unless this fundamental position is understood, the difference between the developed and developing countries can never be bridged, rather the gap is found to widen more and more. So long there is a gap between them, neither peace nor stability in the world could be achieved. With development, structure and contents of education and training should change. They should, therefore, be flexible and sensitive to change as time demands.

In the present circumstances, it has been more or less accepted in principle that to sustain a modern society. Twelve years of schooling is necessary which is to be followed by three to five years of basic tertiary education at the level of a university first degree, followed by post-graduate degree and research for a selected few who can effectively benefit from higher education.

Tertiary education and training has to be tuned to economic and industrial policy and its management. Twelve years of schooling has already been divided into ten years of foundation education or basic cycle followed by two years of higher secondary school education and training.

## Educational Component

While deciding the basic contents of educational component at various levels, it is necessary to keep in view the following major factors:

- (1) Education is holistic in nature, therefore educational component of the learning system should aim at continuous upgrading of knowledge and information from beginning to end of an educational process.

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